

Read PDF A Dfb Diode Laser For Monitoring And Repumping A Barium

**A Dfb Diode  
Laser For  
Monitoring  
And  
Repumping A  
Barium**

This is likewise one of the factors by obtaining the

Read PDF A Dfb

Diode Laser For

Monitoring And

soft documents  
of this **a dfb  
diode laser for  
monitoring and**

**repumping a**

**barium** by

online. You

might not

require more era

to spend to go

to the books

launch as

capably as

search for them.

Read PDF A Dfb

Diode Laser For

Monitoring And

Repumping A

Barium

In some cases,

you likewise

accomplish not

discover the

publication a

dfb diode laser

for monitoring

and repumping a

barium that you

are looking for.

It will

completely

squander the

time.

# Read PDF A Dfb Diode Laser For Monitoring And

However below,  
taking into  
account you  
visit this web  
page, it will be  
consequently  
enormously easy  
to get as  
without  
difficulty as  
download lead a  
dfb diode laser  
for monitoring

# Read PDF A Dfb Diode Laser For Monitoring And Repumping A Barium

It will not say  
yes many get  
older as we run  
by before. You  
can get it  
though do its  
stuff something  
else at house  
and even in your  
workplace. so  
easy! So, are

Read PDF A Dfb

Diode Laser For

Monitoring And

Repumping A  
Barium

you question?  
Just exercise  
just what we pay  
for under as  
competently as

review **a dfb  
diode laser for  
monitoring and  
repumping a**

**barium** what you  
later to read!

~~What is a DFB  
Laser?~~

Read PDF A Dfb

Diode Laser For

~~Distributed And~~

~~Feedback LASER~~

~~or DFB LASER~~

~~basics,~~

~~Structure,~~

~~Working and~~

~~Radiation Power~~

*Laser Diode -*

*EXFO animated*

*glossary of*

*Fiber Optics*

**1270nm DFB Fiber**

**Coupled Laser**

**Diode Five tips**

Read PDF A Dfb

Diode Laser For

to get the most

out of your  
diode laser -

Getting the best

out of your

**laser** Kent

~~Choquette:~~

~~Introduction to~~

~~Vertical-Cavity~~

~~Surface-Emitting~~

~~Lasers (VCSELs)~~

~~and Applications~~

Diode laser

training ELEC413



Read PDF A Dfb  
Diode Laser For  
Semiconductor  
Lasers: Laser  
Repumping A  
Linewidth 1550nm  
1590nm DFB

Butterfly Laser  
Diodes **What is  
Fabry-Perot FP  
Laser**

---

Fabry Parot  
LASER basics,  
Structure,  
Modes, Working  
and Radiation  
Mechanisms

Read PDF A Dfb  
Diode Laser For  
World's Most  
Powerful Visible  
Diode Laser

**HACKED!:** Laser  
Diode from DVD  
Burner ||  
Constant Current  
Source 60 Watt  
Coherent Laser  
Diode Test **All**  
you need to know  
about efficient  
diode laser  
cutting. Have

# Read PDF A Dfb Diode Laser For Monitoring And Endurance lasers Repumping A

---

Everything you  
need to know  
about diode  
lasers  
(presented by  
Endurance  
lasers) ~~515nm vs~~  
~~532nm diode~~  
~~laser~~ 'Most  
Powerful Laser  
Diode' Setting

Read PDF A Dfb

Diode Laser For

up a 17 watt And

laser module!

Laser Diodes -

How it Works 7

~~Best Diode~~

~~Lasers 2019~~

Triple

Wavelength Diode

Laser Hair

Removal Machine

105W @ 975nm

laser diode in

action DILAS

What is VCSEL

Read PDF A Dfb

Diode Laser For

Laser (Vertical  
Cavity Surface  
Emitting Laser)?

MICRO Spectra -

DFB laser -

Resolution gives  
accuracy

DFB laser diode  
at 1570nm

*Semiconductor*

*Laser - I Device  
Structure*

Wavelength

Tunable Laser

Read PDF A Dfb  
Diode Laser For  
Semiconductor  
Laser - III  
Repumping A  
Single Frequency  
Lasers

---

Lessons Learned  
Owning a CNC,  
Diode Laser  
& Co2 Laser

---

Semiconductor  
Laser - II  
Output  
Characteristics  
A Dfb Diode Laser  
For

# Read PDF A Dfb Diode Laser For

A distributed  
feedback laser (DFB) is a type of laser diode, quantum cascade laser or optical fiber laser where the active region of the device contains a periodically structured element or diffraction

Read PDF A Dfb

Diode Laser For

Monitoring And

Repumping A

Barium

a one-

dimensional

interference

grating ( Bragg

scattering) and

the grating

provides optical

feedback for the

laser. This

longitudinal

diffraction

grating has



Read PDF A Dfb  
Diode Laser For  
Monitoring changes  
in refractive  
index that cause  
reflection back  
into the cavity.

Distributed  
feedback laser -  
Wikipedia

Distributed  
Feedback (DFB) :  
Distributed  
Feedback (DFB)  
Diode Lasers are

Read PDF A Dfb

Diode Laser For

fixed wavelength

single mode  
diode lasers.

Typical

geometrical  
sizes of the  
laser chip are  
 $1000\mu\text{m} \times 500\mu\text{m} \times$   
 $200\mu\text{m}$  (length  $\times$   
width  $\times$  height).

The laser chip  
is grown by  
MOVPE of  
compound

# Read PDF A Dfb Diode Laser For semiconductor material. Repumping A Barium DFB »

Distributed  
Feedback Laser »  
Laser Diodes »  
Home ...

ECDL / DFB  
Lasers TOPTICA  
offers diode  
laser systems  
with individual  
wavelengths

Read PDF A Dfb

Diode Laser For

Monitoring 369 -

3500nm. These  
lasers are ideal  
for quantum-

optics and  
-technology and  
spectroscopy.

TOPTICA offers  
diode laser  
systems with

individual  
wavelengths  
between 369 -  
3500nm.

# Read PDF A Dfb Diode Laser For Monitoring And ECDL / DFB Lasers

Diodes sold  
separately and  
in DFB pro  
systems;  
Distributed  
feedback (DFB)  
laser diodes  
feature a  
grating  
structure within  
the

Read PDF A Dfb

Diode Laser For

semiconductor

and thus operate

in both

longitudinal and

transverse

single mode.

Tuning is

achieved by

modulating

either the laser

current or the

chip

temperature.

Mode-hop free

Read PDF A Dfb  
Diode Laser For  
tuning is  
maintained over  
several hundred  
GHz.

DFB -  
Distributed  
Feedback Diodes  
- High-end Laser  
...

The DFB laser  
assemblies are  
based on a  
robust laser

Read PDF A Dfb

Diode Laser For

welding package

that is compatible with

710 Temperature

Controlled TO-

CAN Laser Diode

Mount and

ensures stable

mechanical

coupling to the

9 um core fiber

over a wide

operating

temperature



# Read PDF A Dfb Diode Laser For

Monitoring And  
Repumping A  
Barium

range of  $-40$  to  
 $85$  °C. All fiber  
pigtailed are  
terminated with  
FC/PC fiber  
optic  
connectors.

DFB Single-  
Frequency Fiber  
Pigtailed Laser  
Diodes

DFB Lasers / DBR  
Lasers / RWS

Read PDF A Dfb

Diode Laser For

Lasers Single And

Frequency Laser

Diodes have a wa

velength-

selective

grating

integrated in

the laser chip.

Thus they

operate on a

single resonator

mode emitting qu

asi-

monochromatic

Read PDF A Dfb  
Diode Laser For  
radiation with a  
very small  
linewidth and  
low phase noise.

Single Frequency  
Laser Diodes  
like DFB Lasers  
/ DBR Lasers ...

The PL-DFB-  
A1-1270 1270nm  
DFB laser diode  
module made by  
LD-PD is a cost

Read PDF A Dfb  
Diode Laser For  
effective, And  
highly coherent  
laser source.  
The DFB laser  
diode chip is  
packaged in an  
industry  
standard  
hermetically  
sealed 14 pin  
butterfly  
package with TEC  
and PD Built in.

Read PDF A Dfb  
Diode Laser For  
1270nm High  
power DFB Laser  
diode for O band  
... - LD-PD INC

Distributed  
feedback lasers  
(DFB lasers)  
simultaneously  
provide smooth,  
tunable control  
of wavelength  
and the  
extremely narrow  
spectral width

Read PDF A Dfb

Diode Laser For

required for

precise fiber  
optic

communication

and spectroscopy  
applications.

Integrated  
modules provide  
further

narrowing of the  
spectral line in  
a compact OEM

package that  
features simple

# Read PDF A Dfb Diode Laser For tuning interface.

DFB Lasers and  
Modules | G&H

<http://www.fiberoptics4sale.com/wordpress/> Hello everyone! This is Colin from Fiber Optics For Sale. In this tutorial, we will quickly

# Read PDF A Dfb Diode Laser For Monitoring And Repumping A Barium

explain what is a DFB . . .

## What is a DFB Laser? - YouTube

A distributed feedback laser (DFB) is a type of single frequency laser diode. DFBs are the most common transmitter type in DWDM



Read PDF A Dfb Diode Laser For Monitoring And Repumping A Barium

-systems. To stabilize the lasing wavelength, a diffraction grating is etched close to the p-n junction of the diode.

Laser diode -  
Wikipedia

Eblana's DFB laser is built

Read PDF A Dfb

Diode Laser For

using discrete-  
mode (DM)

technology,

delivering a

cost-effective

laser diode with

mode-hop free

tuneability,

excellent SMSR,

and narrow

linewidth.

Eblana Photonics

EP1310-DM-B

laser diode

Read PDF A Dfb  
Diode Laser For  
Monitoring And  
series is  
available at a  
range of  
wavelengths from  
1300 - 1320 nm.  
1310nm for High  
Performance  
Communications  
Applications

1310nm DFB Laser  
Diode, 14mW (  
10G Data  
Networks )

Read PDF A Dfb

Diode Laser For

LASER DIODE And

SOURCE.com,  
Wavelengths from  
370nm to

15,000nm, ALL OF  
THE

MANUFACTURERS On  
One Site,

Research &

Compare - Select  
the Best Laser  
Diode Shop

10,000 + Laser  
Diodes,

# Read PDF A Dfb Diode Laser For Monitoring And All Laser Diode Wavelengths & Brands, One Site, Comparison

...

QPhotonics  
offers a variety  
of single mode  
fiber pigtailed  
laser diodes in  
the wavelength  
range from 660nm  
to 1550nm in 14

# Read PDF A Dfb Diode Laser For pin DIL, Butterfly, mini DIL packages.

Their output  
power varies  
from 1mW to  
300mW ex-fiber.

OPhotonics,  
Laser diode  
online store  
Finished laser  
module. Such  
modules have a

Read PDF A Dfb

Diode Laser For

DFB laser diode  
emitting at  
1550nm, a thermo-  
electric cooler

(TEC) for  
maintaining the  
laser diode at  
constant  
temperature, a  
14-pin butterfly-  
housing, full  
hermeticity  
attained via  
laser-welding

Read PDF A Dfb  
Diode Laser For  
technology, and  
a polarisation-  
maintaining  
fibre pigtail.

Space validation  
of 1550nm DFB  
laser diode  
module

Sacher  
Lasertechnik is  
technology  
leader for  
tunable high



Read PDF A Dfb

Diode Laser For

power external  
cavity diode  
lasers.

Applications

incl. Absorption

and Raman

spectroscopy,

environmental

analysis,

process control,

biomedical DFB

Distributed

Feedback Laser

Diode » Laser

Read PDF A Dfb  
Diode Laser For  
Diodes »  
Available  
Products » Shop  
| Sacher  
Lasertechnik  
Group

DFB Distributed  
Feedback Laser  
Diode » Laser  
Diodes ...

The Distributed  
Feedback (DFB)  
Laser (available

Read PDF A Dfb

Diode Laser For

Monitoring And

in NIR and MIR) incorporates the grating within

the laser diode structure itself

(see Figure 2).

This corrugated periodic

structure

coupled closely

to the active

region acts as a

Bragg reflector,

selecting a

Read PDF A Dfb  
Diode Laser For  
single  
longitudinal  
mode as the  
lasing mode.

Single Frequency  
Lasers Tutorial  
- Thorlabs

1550 nm laser  
diode - CW or  
Pulsed - DFB or  
Bragg up to 400  
mW These fiber-  
coupled 1550 nm

Read PDF A Dfb

Diode Laser For

laser diodes are offered as stock items or

associated with a CW or Pulsed Laser Diode

Driver. They are compatible with our high speed nanosecond

pulsed drivers and this makes an optimal solution for

# Read PDF A Dfb Diode Laser For LIDAR Time-of- Flight or 3D- sensing R&D. Repumping A Barium

1550 nm laser  
diode up to 400  
mW - fiber  
coupled DFB ...  
#72 TDLAS-based  
NH<sub>3</sub> mole  
fraction  
measurement for  
exhaust  
diagnostics

Read PDF A Dfb

Diode Laser For

Monitoring selective

catalytic

reduction using

a fiber-coupled

2.2- $\mu\text{m}$  DFB Diode

laser; F.

Stritzke, O.

Diemel, S.

Wagner, App.

Phys. B, 2015,

119, pp.

143-152.

Read PDF A Dfb

Diode Laser For

Monitoring And

presenting a  
thorough

analysis of DFB

lasers from a

level suitable

for research

students, this

book emphasises

and gives

extensive

coverage of

computer aided

modeling



Read PDF A Dfb  
Diode Laser For  
techniques. And  
Repumping A  
Diode Lasers and  
Barium  
Photonic

Integrated  
Circuits, Second  
Edition provides  
a comprehensive  
treatment of  
optical  
communication  
technology, its  
principles and  
theory, treating

Read PDF A Dfb

Diode Laser For

students as well

as experienced  
engineers to an  
in-depth

exploration of  
this field.

Diode lasers are  
still of

significant  
importance in

the areas of  
optical

communication,  
storage, and

Read PDF A Dfb  
Diode Laser For  
Monitoring And  
sensing. Using  
the the same  
well received  
Barium  
theoretical  
foundations of  
the first  
edition, the  
Second Edition  
now introduces  
timely updates  
in the  
technology and  
in focus of the  
book. After 15

Read PDF A Dfb

Diode Laser For

Monitoring And

development in  
the field, this

book will offer

brand new and

updated material

on GaN-based and

quantum-dot

lasers, photonic

IC technology,

detectors,

modulators and

SOAs, DVDs and

storage, eye

Read PDF A Dfb

Diode Laser For

diagrams and BER  
concepts, and  
DFB lasers.

Appendices will  
also be expanded  
to include  
quantum-dot  
issues and more  
on the relation  
between  
spontaneous  
emission and  
gain.

Read PDF A Dfb

Diode Laser For

Monitoring And

Repumping A

Barium

published in

1997, the

photonics

landscape has

evolved

considerably and

so has the role

of distributed

feedback (DFB)

laser diodes.

Although tunable

Read PDF A Dfb

Diode Laser For

Monitoring And

Repumping A  
Barium

laser diodes  
continue to be  
introduced in  
advanced optical

communication

systems, DFB

laser diodes are

still widely

applied in many

deployed

systems. This

also includes

wavelength

tunable DFB

Read PDF A Dfb

Diode Laser For

laser diodes and

DFB laser diode

arrays, usually

integrated with

intensity or

phase modulators

and

semiconductor

optical

amplifiers. This

valuable

resource gives

professionals a

comprehensive



Read PDF A Dfb

Diode Laser For

description of

the different  
effects that

determine the

behavior of a

DFB laser diode.

Special

attention is

given to two new

chapters on

wavelength

tunable DFB

laser diodes and

bistable and

Read PDF A Dfb

Diode Laser For

unstable DFB And

laser diodes.

Among many other  
updates

throughout the  
reference, semi-  
conductor and  
electromagnetic  
professionals  
are also

provided two new  
appendices. This  
book fully  
covers the

Read PDF A Dfb  
Diode Laser For  
underlying And  
theory,  
commercial  
applications,  
necessary design  
criteria, and  
future direction  
of this  
technology.

Advances in  
optical fibre

Read PDF A Dfb  
Diode Laser For  
Monitoring And  
based communications  
systems have  
played a crucial  
role in the  
development of  
the information  
highway. By  
offering a  
single mode  
oscillation and  
narrow spectral  
output,  
distributed

Read PDF A Dfb

Diode Laser For

feedback (DFB)

semiconductor

laser diodes

offer excellent

optical light

sources as well

as optical

filters for

fibre based

communications

and dense

wavelength

division

multiplexing

# Read PDF A Dfb Diode Laser For (DWDM) systems.

This comprehensive text focuses on the basic working principles of DFB laser diodes and optical filters and details the development of a new technique for enhanced

Read PDF A Dfb  
Diode Laser For  
Monitoring And  
performance.  
Repumping A  
Barium  
system  
performance.  
Considers the  
optical  
waveguiding  
characteristics  
and properties  
of semiconductor  
materials and  
the physics of  
DFB  
semiconductor  
lasers. Presents  
a powerful

Read PDF A Dfb  
Diode Laser For  
Modelling And  
technique based  
on the transfer  
matrix method  
which can be  
used to improve  
the design of  
laser diodes,  
optical fibres  
and amplifiers.  
Examines the  
effect of the  
various  
corrugation



# Read PDF A Dfb Diode Laser For Monitoring And Repumping A Barium

shapes on the  
coupling  
coefficients and  
lasing

characteristics  
of DFB laser  
diodes.

Technical advice  
to improve  
immunity against  
the spatial hole  
burning effect.

Extensive  
referencing

Read PDF A Dfb

Diode Laser For

throughout and a

comprehensive

glossary of

symbols and

abbreviations.

Suitable for

both

introductory and

advanced levels

This is an

indispensable

textbook for

undergraduate

and postgraduate

Read PDF A Dfb  
Diode Laser For  
students of  
electrical and  
electronic  
engineering and  
physics as it  
consolidates  
their knowledge  
in this rapidly  
growing field.  
As a technical  
guide for the  
structural  
design of DFB  
laser diodes and

Read PDF A Dfb  
Diode Laser For  
Monitoring filters,  
the book will  
serve as an  
invaluable  
reference for  
researchers in o  
pto-electronics,  
and semi  
conductor device  
physics.

This book is  
composed of  
seven invited

Read PDF A Dfb

Diode Laser For

papers which

present the  
current status

of high speed

diode lasers.

Fast carrier and

photon dynamics

in directly

modulated MQW

lasers is

analyzed and

novel design

approaches are

considered which

Read PDF A Dfb

Diode Laser For

Monitoring And

Repumping A

Barium  
and record of 40

GHz modulation  
bandwidth.

Attention is  
centered on the  
challenges in  
creation of high  
speed and low  
chirp single  
mode DFB lasers.

Recent progress

Read PDF A Dfb

Diode Laser For

in mode-locked

diode lasers is  
covered,

specifically by

the examples of

160 fs pulse

generation and

appearance of

microwave pulse

repetition

rates. Future

trends in

increasing of

high speed laser

Read PDF A Dfb  
Diode Laser For  
performance are  
also examined.

Repumping A  
Barium  
Laser Diode  
Microsystems  
provides the  
reader with the  
basic knowledge  
and  
understanding  
required for  
using  
semiconductor  
laser diodes in



Read PDF A Dfb

Diode Laser For

Monitoring And

microsystems and

micro-optical

electromechanic

systems. This

tutorial

addresses the

fundamentals of

semiconductor

laser operation

and design,

coupled with an

overview of the

types of laser

Read PDF A Dfb

Diode Laser For

Monitoring suitable

for use in

Microsystems,

along with their

distinguishing

characteristics.

Emphasis is

placed on laser

diode

characterization

and measurement

as well as the

assembly

techniques and

Read PDF A Dfb  
Diode Laser For  
Monitoring And  
accessories  
Repumping A  
required for  
Barium  
incorporation of  
semiconductor  
lasers into  
complex  
microsystems.  
Equipped with  
typical results  
and calculation  
examples, this  
hand-on text  
helps readers to

Read PDF A Dfb

Diode Laser For

develop a feel

for how to  
choose a laser  
diode,

characterize it  
and incorporate  
it into a  
microsystem.

The German Space  
Agency DLR is  
supporting a  
sounding rocket  
mission that

Read PDF A Dfb

Diode Laser For

aims to generate

a Bose-Einstein-

Condensate (BEC)

onboard a

sounding rocket

in 2017. At the

time when the

research and

technical

developments

described in

this thesis were

initiated, there

were no laser

Read PDF A Dfb

Diode Laser For

technologies And

available  
Repumping A

meeting the  
Barium  
requirements

regarding

compactness and

reliability.

This work is

therefore

devoted to

developing the

required laser

technologies

that will

Read PDF A Dfb

Diode Laser For

Monitoring And

demonstration of

BEC and atomic

interferometry

in space for the

first time ever.

This research

was carried out

as part of the

project "LASUS"

which provided

the technology

development for

the sounding

Read PDF A Dfb

Diode Laser For

rocket mission

"MAIUS". In the  
framework of  
this thesis,

concepts were

developed to

realize micro-

integrated

extended cavity

diode lasers

(ECDLs) for

rubidium (Rb)

and potassium

(K)



# Read PDF A Dfb Diode Laser For Spectroscopy And

The ECDL modules  
contain only non-  
moveable

components that  
are integrated  
on a micro-  
optical bench  
with footprints  
of 50 x 10 mm<sup>2</sup>  
and 80 x 25 mm<sup>2</sup>.  
They are based  
on a Littrow  
configuration

Read PDF A Dfb

Diode Laser For

with an external  
cavity length of  
~30 mm. The

micro-integrated

ECDLs provide an

output power  $\geq$

35 mW behind a

micro-optical

isolator with 30

dB isolation and

a short-term

(170  $\mu$ s) FWHM

linewidth of

significantly

Read PDF A Dfb

Diode Laser For

less than 100

kHz. The

intrinsic  
linewidth

corresponds to

only 260 Hz. To

qualify the

micro-integrated

ECDLs for future

quantum optics

precision

experiments in

space, vibration

tests (8.1 gRMS

Read PDF A Dfb

Diode Laser For

and 21.4 gRMS)

and mechanical  
shock tests

(1500 g) were  
carried out. No  
degradation of  
the electro-  
optical  
performance was  
observed.

Moreover, the  
electro-optical  
properties of  
the macroscopic

Read PDF A Dfb

Diode Laser For

ECDLs were

optimized for  
micro-integrated  
ECDL modules.

Further,

distributed  
feedback diode  
(DFB) lasers

were electro-  
optically

characterized

and optimized,

again for Rb and

K spectroscopy.

Read PDF A Dfb

Diode Laser For

Rb-DFB lasers

provide single  
mode emission

with an output

power of more

than 180 mW. The

K-DFB lasers

feature an

excellent

spectral

stability with a

short term (10

$\mu$ s) FWHM

linewidth of 320

Read PDF A Dfb  
Diode Laser For  
kHz, and their  
intrinsic  
linewidth  
Barium  
corresponds to 5  
kHz.

Laser diodes  
represent a key  
element in the  
emerging field  
of opto  
electronics

Read PDF A Dfb

Diode Laser For

Monitoring And

Repumping A

Barium

communication,

optical sensors

or optical disc

systems. For all

these

applications,

information is

either

transmitted,

stored or read

out. The



Read PDF A Dfb

Diode Laser For

performance of

these systems

depends to a

great deal on

the performance

of the laser

diode with

regard to its

modulation and

noise

characteristics.

Since the

modulation and

noise

Read PDF A Dfb

Diode Laser For

Monitoring And

Repumping A

Barium

characteristics

of laser diodes

are of vital

importance for

optoelectronic

systems, the

need for a book

arises that

concentrates on

this subject.

This book thus

closes the gap

between books on

the device

Read PDF A Dfb  
Diode Laser For  
physics of  
semiconductor  
lasers and books  
on system  
design.

Complementary to  
the specific  
topics  
concerning  
modulation and  
noise, the first  
part of this  
book reviews the  
basic laser

Read PDF A Dfb

Diode Laser For

characteristics,

so that even a  
reader without  
detailed

knowledge of  
laser diodes may  
follow the text.

In order to  
understand the  
book, the reader  
should have a  
basic knowledge  
of electronics,  
semiconductor

Read PDF A Dfb

Diode Laser For

physics and

optical  
communications.

The work is

primarily

written for the

engineer or

scientist

working in the

field of

optoelectronics;

however, since

the book is self-

contained and

Read PDF A Dfb

Diode Laser For

Monitoring And

since it contains a lot  
of numerical

examples, it may

serve as a

textbook for

graduate

students. In the

field of laser

diode modulation

and noise a vast

amount has been

published during

recent years.

Read PDF A Dfb

Diode Laser For

Monitoring And

Even though the  
book contains

more than 600

references, only

a small part of

the existing

literature is

included.

Copyright code :

65c21ace2beea5d5

f4e48f3d9d1fe021