

Thick Copper

IMS

HSMtec

ECP®

Multilayer

Double sided PTH

2.5D®

Flexible & Rigid Flexible

NucleuS®

HDI Any-Layer

Metal Core

IC Substrate

HDI Microvia

AT&S

First choice for advanced applications

AT&S AT A GLANCE

AT&S is one of the world's leading suppliers of high-value printed circuit boards

AT&S has the most advanced high-tech facility for mass production of HDI printed circuit boards in China, the centre of electronics manufacturing. Other plants, in Austria, India and Korea, concentrate on small and medium-sized batches for industrial and automotive customers.

AT&S uses problem-solving skills to add value

AT&S's broad portfolio of technologies allows it to provide cutting edge, user-orientated solutions – from prototypes to printed circuit boards for rapid application in industrial manufacturing – acting as a one-stop-shop. This results in major reductions in product development lead times for customers, meaning that AT&S adds value for customers above and beyond the production of sophisticated printed circuit boards.

AT&S operates in attractive niche growth markets

AT&S is supporting all of the major trends in the electronics industry, including further miniaturisation, the internet of things, and wearables. It is these innovations that will drive growth and technological development in the future. AT&S also supplies the leading players in the supply industry for European premium car brands. Over 500 industrial customers rely on the solutions and products offered by AT&S, and the Group supplies the market and technology leaders in each sector.

AT&S cultivates the tradition of European engineering in a highly industrialised setting

The Group spends around 5% of its annual revenues on research and development, enabling it to anticipate the applications of tomorrow. Highly qualified employees as well as numerous partnerships with universities and international research institutes ensure that these activities meet the required standards of excellence.

AT&S is committed to the highest quality standards

All of AT&S's production facilities are certified in accordance with ISO 9001 and/or ISO/TS 16969. AT&S is one of only a handful of printed circuit board manufacturers that also has certification according to the EN ISO 13845 standard for medical products and the EN 9100 for the aerospace industry.

AT&S conforms to the latest international CSR standards

AT&S produces highly complex printed circuit boards with a minimal impact on people and the environment. Sustainability is a strategic priority for the Group, which achieves annual reductions in CO₂ emissions and consumption of fresh water. Creating sustainable solutions for customers is the central focus of AT&S's activities.

VISION

**AT&S first choice
for advanced applications**

MISSION

**We set the highest quality
standards in our industry**

**We industrialize leading edge
technology**

We care about people

We reduce our ecological footprint

We create value

APPLICATION AREAS

Today's digital industry would be nothing without printed circuit boards. They are the 'brains' of virtually all electronic appliances – smartphones, navigation systems, cameras, automotive electronics, aeronautics – and a large number of modern industrial and medical technologies. They are central to our everyday life.



AT&S INDIA

CUSTOMER SEGMENTS



AUTOMOTIVE & AVIATION

In its automotive and aviation businesses, AT&S activities focus principally on safety systems, entertainment, electromobility, weight reduction and future driver assistance systems for driverless cars. The product portfolio covers the full range of technologies used in the automobile industry. Virtually all of the major tier one European automotive component suppliers in the premium segment are AT&S customers.



INDUSTRIAL

AT&S's industrial market comprises a large number of customers with an extremely wide range of technological requirements. A high degree of flexibility and the ability to adapt to new technical specifications are crucial success factors in this business.



MEDICAL

In medical applications, reductions in size and weight, and product reliability are the prime concern, especially for devices such as pacemakers and hearing aids. Here, our wealth of experience gained in the mobile devices business is an additional benefit to our customers.



5G TELECOMMUNICATION

The 5G technology expands coverage into multiple sectors like smartphones, electronics, health care, automotive, manufacturing, retail, entertainment, communication industries etc. Our focus is on communication infrastructure in general and base station, cell towers and antennas in particular.



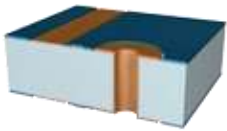
AT&S INDIA

PRODUCT PORTFOLIO



AT&S is a world leader in the global market for high-end printed circuit boards – a reflection of its acknowledged competence in the production of top quality, custom solutions using state-of-the-art printed circuit board technologies.

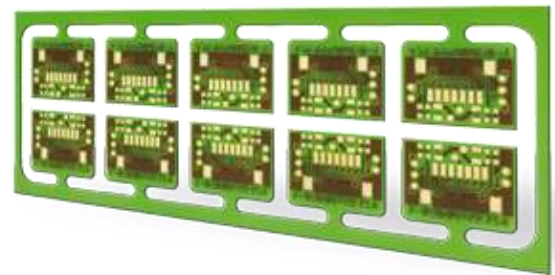
Double-sided printed circuit boards



Double-sided plated-through printed circuit boards are in use throughout the electronics sector, and more particularly in industrial and automotive applications. AT&S specialises in series production of double-sided printed circuit boards with thicknesses in the 0.1-3.2mm range.

AT&S offers double-sided plated-through printed circuit boards with the following special features:

- Edge plating for shielding and ground connection
- Copper inlay for hotspot cooling
- Solder resist in green, white, black, blue, red etc.
- Copper thickness of over 140µm
- All surfaces which are commonly used in the printed circuit board industry



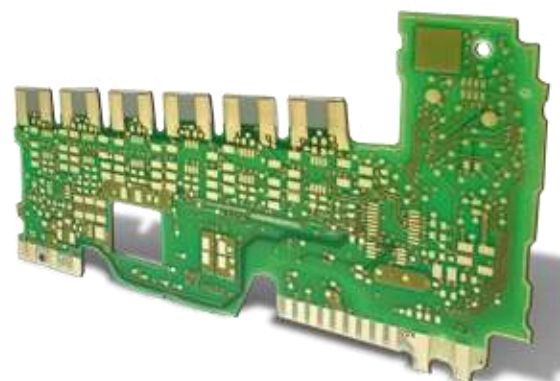
Multilayer printed circuit boards



Multilayer printed circuit boards came into the industry with the advent of SMD population. They are found almost everywhere, wherever electronics are in use – from aircraft to motorcycles, and storage power stations to photovoltaics. AT&S produces printed circuit boards in whatever numbers are required – from individual prototypes to small batches and mass production. The number of layers ranges from 4 to 28, with a maximum thickness of 3.2mm.

AT&S offers multilayer printed circuit boards with the following special technologies:

- Edge plating for shielding and ground connection
- High frequency base materials for applications up to 80 GHz
- Cavities, countersunk holes or depth milling
- Thick copper up to 105µm (inner and outer layers)
- Solder resist in green, white, black, blue, red etc.
- Controlled impedances (single, differential, etc.)
- All recognised printed circuit board industry surfaces available





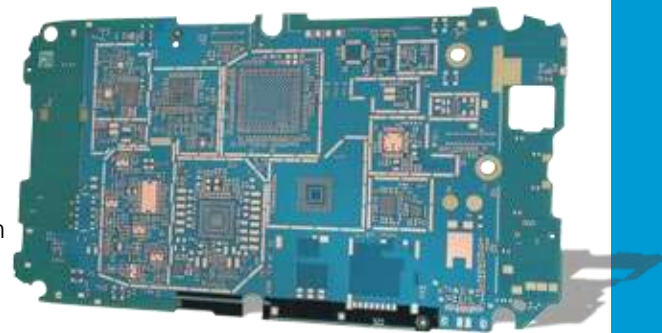
HDI microvia printed circuit boards



The history of AT&S has been shaped by high density interconnect (HDI) printed circuit boards. In 1997 they were developed for mass production for the nascent mobile phone industry. Since then HDI printed circuit boards have found applications throughout the electronics industry, and their use was given additional impetus by the introduction of BGA/CSP components. AT&S offers the full range of technologies, from 4-layer laser to 6-n-6 HDI multilayer in all thicknesses.

Special technologies offered by AT&S in connection with HDI:

- Edge plating for shielding and ground connection
- Copper-filled microvias
- Stacked and staggered microvias
- Cavities, countersunk holes or depth milling
- Solder resist in black, blue, green, etc.
- Minimum track width and spacing in mass production around 50µm
- Low-halogen material in standard and high Tg range
- Low-DK Material for Mobile Devices
- All recognised printed circuit board industry surfaces available



HDI any-layer printed circuit boards



HDI any-layer printed circuit boards are the next technological enhancement of HDI microvia printed circuit boards: all the electrical connections between the individual layers consist of laser-drilled microvias. The main advantage of this technology is that all the layers can be freely interconnected. To produce these circuit boards AT&S uses laser-drilled microvias electroplated with copper.

Special technologies used with HDI any-layer printed circuit boards:

- Edge plating for shielding and ground connection
- Minimum track width and spacing in mass production around 40µm
- Stacked microvias (plated copper)
- Cavities, countersunk holes or depth milling
- Solder resist in black, blue, green, etc.
- Low-halogen material in standard and high Tg range
- Low-DK Material für Mobile Devices
- All recognised printed circuit board industry surfaces available

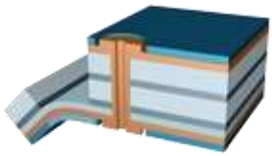


AT&S INDIA

PRODUCT PORTFOLIO



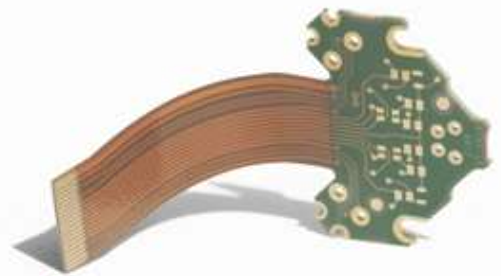
Rigid-flexible printed circuit boards



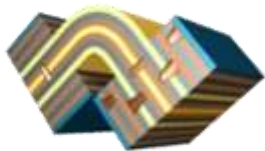
Rigid-flexible printed circuit boards directly combine the advantages of flexible and rigid printed circuit boards. This combination of technologies brings the user a variety of advantages especially in terms of signal transmission, overall size, assembly and stability. AT&S produces this technology in three of its plants, allowing it to offer a wide range of products and expertise.

In rigid-flexible printed circuit boards, AT&S offers:

- Printed circuit boards with rigid areas, and flexible areas with reduced numbers of layers
- Combination of FR4 and thin laminate
- Rigid-flexible printed circuit boards, which connect rigid boards without the need for cables or connectors, resulting in better signal transmission
- With SMD population and underfill
- All commonly used surfaces available



HDI rigid-flex printed circuit boards



In response to market requirements, AT&S also offers mass production of its core HDI technology in combination with flexible printed circuit boards. To make this possible, AT&S has entered into a collaborative agreement with a world market leader in flexible circuit board technology.

In HDI rigid-flex, AT&S can offer the following features:

- Combination of HDI rigid and HDI flex layers
- Stacked and staggered microvias on all layers
- Halogen-free base material (medium Tg) and polyimide
- SMD population
- Mechanical assembly in or on the housing

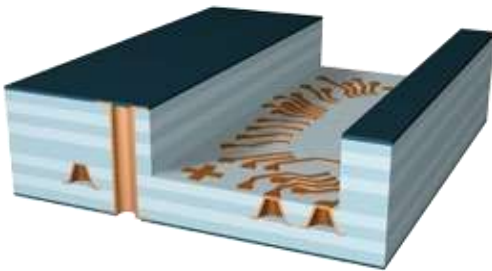


AT&S TECHNOLOGIES



The portfolio of patented technologies focuses on the continuing trend towards miniaturisation combined with performance enhancement and reduced consumption of natural resources.

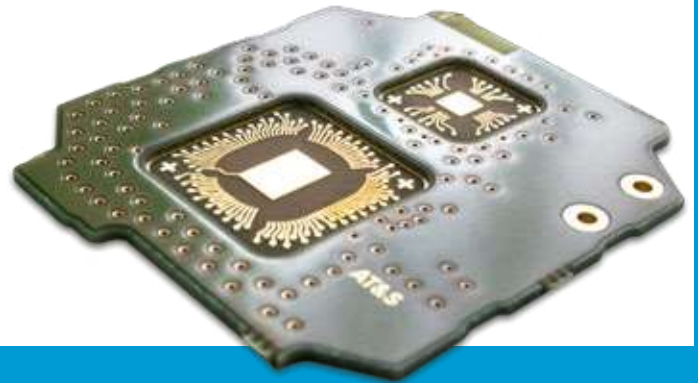
2.5D[®] Technology Platform



The 2.5D[®] Technology Platform is a patented AT&S technology for combining mechanical and electronic miniaturisation. It can be used to make cavities in the printed circuit board so that electronic components can be positioned lower, with the result that the complete assembly has a thinner profile. In addition to cavities, flex-to-install printed circuit boards with inner and outer flex layers are also possible. The use of polyimide-free base materials makes for extremely reliable printed circuit boards.

Advantages

- Cost advantages over conventional cavity and rigid-flex approaches as a result of the elimination of several process steps (e.g. stamping) and the use of standard printed circuit board materials (e.g. prepregs, RCC foils)
- Cavities of different depths on the same printed circuit board, and no restrictions on cavity shapes
- No restrictions on base materials, and use of state-of-the-art design rules
- Surfaces of cavities suitable for solder resist
- Different technologies can be combined (e.g. rigid-flex and cavity)
- UL approval for cavity and rigid-flex applications



Contact us

Technical contact for our products and technologies

Hubert Haidinger

Fabriksgasse 13
8700 Leoben
Austria
Tel.: +43 3842 200 5852
E-Mail: h.haidinger@ats.net

Wolfram Zotter

1735 N First Street, Ste 245,
San Jose, CA 95112
U.S.A.
Tel. +1 408 573 1411
E-mail: w.zotter@ats.net

Roland Wilfing

5000, Jin Du Road, Xinzhuang Industry Park
Minhang District, Shanghai 201108,
P.R. China
Tel.: +86 2124 080 190
E-Mail: r.wilfing@ats.net

Vockenberger Christian

Fabriksgasse 13
8700 Leoben
Austria
Tel. +43 3842 200 5801
E-mail: c.vockenberger@ats.net

GLOBAL PRESENCE

AT&S LOCATIONS AND COMPETENCES

- Production facilities in Europe and Asia
- Headquarters in Leoben, Austria
- Procurement centre in Hong Kong, China
- Design centre in Düren, Germany
- Sales network spanning three continents
- Approximately 8,700 staff

Each AT&S plant concentrates on a specific portfolio of technologies. The Austrian plants primarily supply the European market and increasingly the American one. In Europe, short lead times, special applications and closeness to customers are typically the most important considerations. The plants in Austria, India and Korea generally concentrate on small and medium-sized batches for industrial and automotive customers. In Shanghai, the focus is on large-volume production of HDI printed circuit boards for mobile communications customers, and increasingly also for the automotive industry. In February 2016, the series production of IC substrates started in our new production plant in Chongqing, China.

Shanghai and Leoben are major technology drivers within the AT&S Group thanks to their research and development facilities.



- Plants
- Sales offices / representations

LEOBEN, AUSTRIA

HEADQUARTERS

- Staff: 1,000
- Opened: 1982
- Production capacity: 110,000 square metres
- Customer orientation: Automotive, Industrial, Medical

TECHNOLOGIES

- Standard printed circuit boards
- HDI Multilayer printed circuit boards
- Rigid-flex printed circuit boards
- ECP® (Embedded Component Packaging)
- Printed circuit boards for high voltage applications
- Prototypes, test- and reference boards

CERTIFICATIONS

- ISO 9001:2008
- ISO/TS 16949:2009
- ISO 14001:2004
- OHSAS 18001:2007
- DS/EN ISO 13485:2003
- Sony Green Partner Certificate
- EN9100:2009
- AEO Certificate
- UL Listing

FEHRING, AUSTRIA

- Staff: 400
- Opened: 1974
- Production capacity: 300,000 square metres
- Customer orientation: Automotive, Industrial

TECHNOLOGIES

- Double-sided plated-through printed circuit boards
- Rigid-flex printed circuit boards
- Flexible printed circuit boards
- Metal core printed circuit boards
- IMS (Insulated Metallic Substrate)

CERTIFICATIONS

- ISO 9001:2008
- ISO/TS 16949:2009
- ISO 14001:2004
- OHSAS 18001:2007
- Sony Green Partner Certificate
- AEO Certificate
- UL Listing

NANJANGUD, INDIA

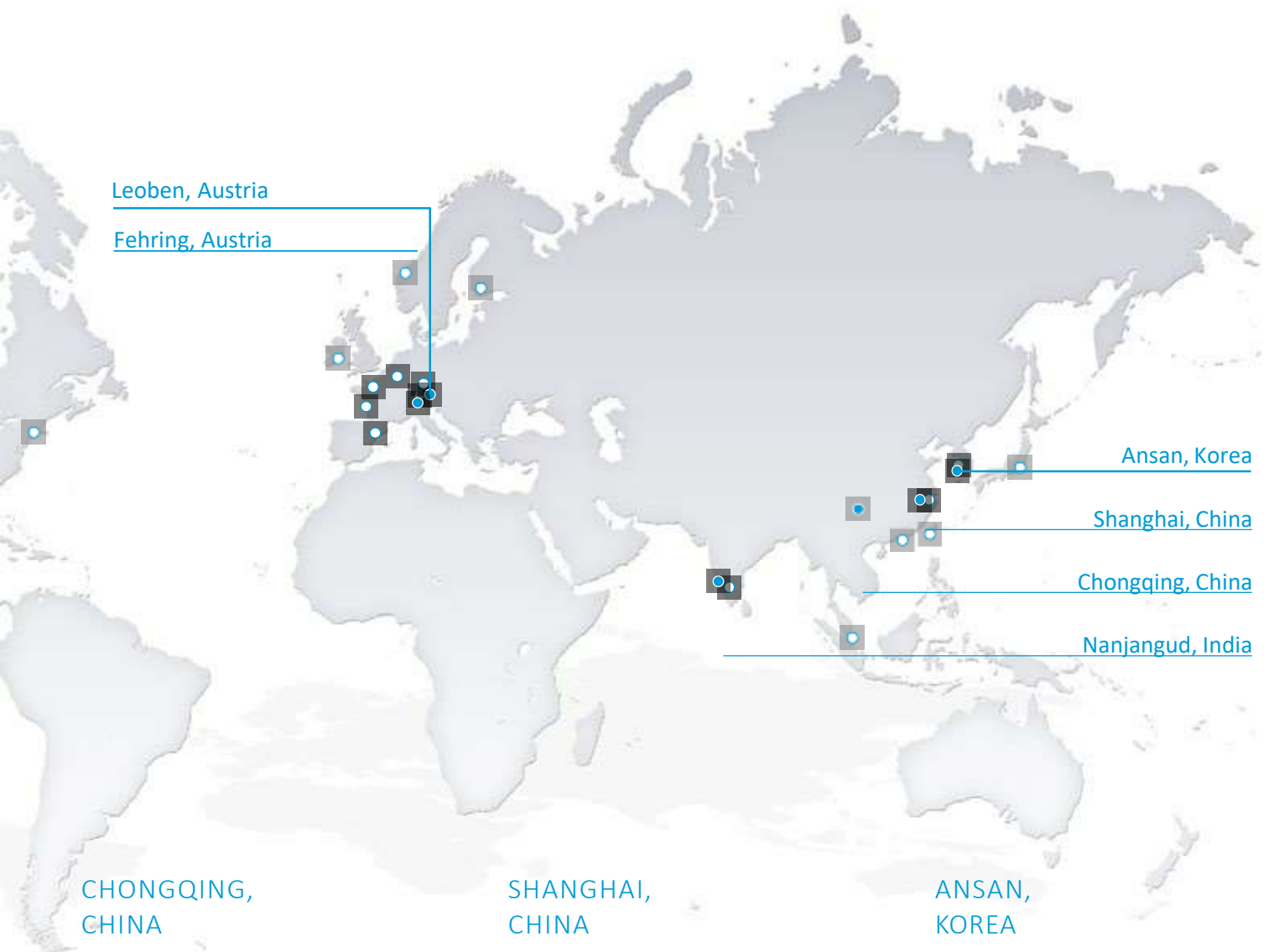
- Staff: 1,100
- Opened: 1999
- Production capacity: 380,000 square metres
- Customer orientation: Automotive, Industrial

TECHNOLOGIES

- Standard printed circuit boards
- HDI Multilayer printed circuit boards
- Rigid-flex printed circuit boards
- Printed circuit boards for high voltage applications

CERTIFICATIONS

- ISO 9001:2008
- ISO/TS 16949:2009
- ISO 14001:2004
- OHSAS 18001:2007
- UL Listing



Leoben, Austria

Fehring, Austria

Ansan, Korea

Shanghai, China

Chongqing, China

Nanjangud, India

**CHONGQING,
CHINA**

- Start series production (plant 1): February 2016
- Production Capacity : 75,000 square metres
- Customer Orientation : 100% IC Packaging

TECHNOLOGIES

Flip Chip IC Packaging Substrates with:

- Buried Via Cores (reinforced)
- BU Film/SAP build-up process
- Micro bump C4 sites
- Single/multiple die C4 sites
- Surface Mount Chip Passives
- BGA/LGA form-factors

CERTIFICATIONS

- ISO 9001:2008
- ISO 14001:2008
- OHSAS 18001:2007

**SHANGHAI,
CHINA**

- Staff: 4,500
- Opened: 2002
- Production capacity: 790,000 square metres
- Customer orientation: Mobile Devices, Automotive

TECHNOLOGIES

- HDI multilayer printed circuit boards
- Rigid-flex HDI printed circuit boards
- HDI any-layer printed circuit boards

CERTIFICATIONS

- ISO 9001:2008
- ISO/TS 16949:2009
- ISO 14001:2004
- OHSAS 18001:2007
- Sony Green Partner Certificate
- Canon Green Partner Certificate
- UL Listing

**ANSAN,
KOREA**

- Staff: 300
- Opened: 2006
- Production capacity: 120,000 square metres
- Customer orientation: Industrial, Automotive, Mobile Devices, Medical

TECHNOLOGIES

- Single and double-sided flexible printed circuit boards
- Flexible multilayer circuit boards
- Rigid-flex printed circuit boards
- Flexible printed circuit boards with metal reinforcement

CERTIFICATIONS

- ISO 9001:2008
- ISO/TS 16949:2009
- ISO 14001:2004
- OHSAS 18001:2007
- UL Listing

AT&S Plants

AT & S Austria Technologie & Systemtechnik Aktiengesellschaft
(Headquarters)
Fabriksgasse 13,
8700 Leoben, Austria
Tel.: + 43 3842 200-0
E-mail: sales@ats.net

AT & S Austria Technologie & Systemtechnik Aktiengesellschaft
Industriepark 4,
8350 Fehring, Austria
Tel: +43 3155 500-0

AT&S Legal Entities

AT&S Deutschland GmbH
Schenkelstraße 23,
52349 Düren, Germany
Tel.: +49 2421 4404 900
E-mail: sales@ats.net

AT&S Asia Pacific Limited
1617-19 16F,
Tower 3 China Hong Kong City,
33 Canton Road Tsim Sha Tsui,
Kowloon, Hong Kong
Tel.: +852 3556 6800
E-mail: asiapacific@ats.net

AT&S (China) Company Limited
5000 Jin Du Road,
Xinzhuang Industry Park,
Minhang District
Shanghai 201108, P.R. China
Tel.: +86 21 24080 000

AT&S India Private Limited
12A, Industrial Area, Nanjangud
571301 Karnataka, India
Tel.: +91 8221 304000

AT&S Americas LLC
1735 North First Street, Suite 245
San Jose, CA 95112, USA
Tel.: +1 408 573 1211
E-mail: m.tschandl@ats.net

AT&S Japan KK
White Akasaka 8F, 5-4-13 Akasaka
Minato-ku, Tokyo 107-0052, Japan
Tel.: +81 3 3568 6866
E-mail: sales@ats.net

AT&S (Chongqing) Company Limited
No.58, Chang He Road,
Yuzui Town,
Jiangbei District
Chongqing 401133, P.R. China
Tel.: +86 236 1856 0

AT&S Korea Company Limited
289, Sinwon-ro, Danwon-gu,
Ansan-City, Gyeonggi-do,
South Korea
Tel: +82 31 495 2277

AT&S (Taiwan) Company Limited
Shin Kong Manhattan Building,
14F, No.8, Sec.5, Xinyi Road,
Taipei 11049, Taiwan
Tel.: +886 2 87582354
E-mail: i.law@ats.net