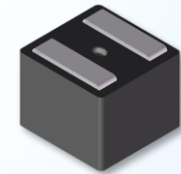
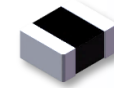




Automotive-Grade

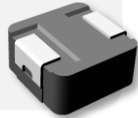
Molded Power Choke

2024



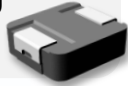
2009 UPI Series

Cold press molding
Lead-Frame Terminal
(or Solder Terminal)



2014 HPI Series

Cold and Hot press molding
Lead-Frame Terminal



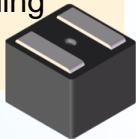
2018 PHP Series

Cold and Hot press molding
Electroplated Terminal



2023 TUP Series

New Cold & Hot press molding
Electroplated Terminal



2024 CTP Series

New Cold & Hot press molding
Lead-Frame Terminal



Comfort

In-Vehicle Infotainment
Drive Recorder
Charging Wired
Charging Wireless
Car Audio



Car-Body

Lighting (LED)
Smart Entry System
TPMS
Telematics Control Unit
DSRC
Zone ECU



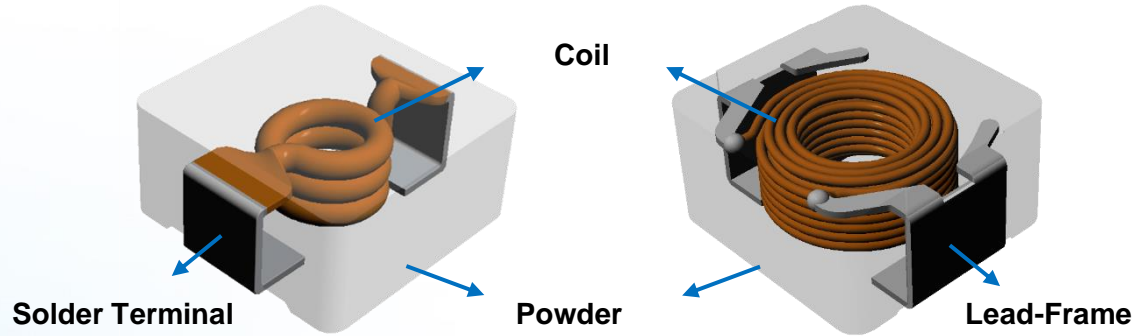
Safety

ADAS/AD ECU
Brake
(ABS, ESC, Boost Brake)
Radar
Parking Assist
(View Camera)

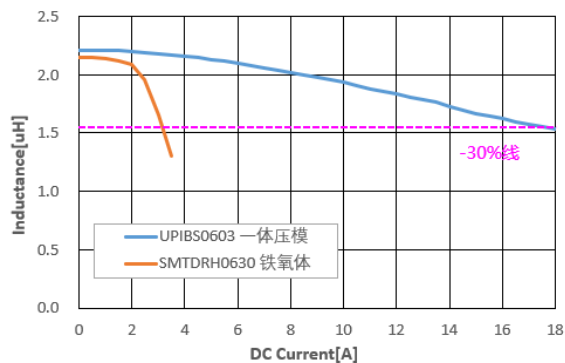


Powertrain

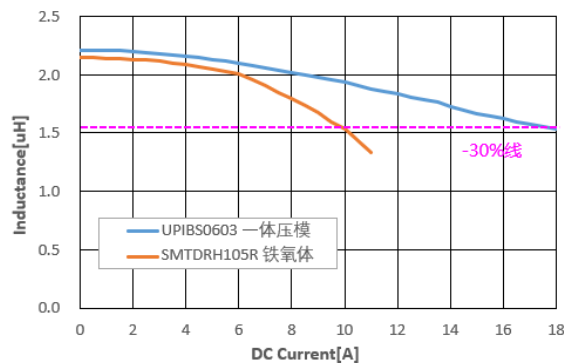
Engine ECU
Transmission ECU
Motor Actuator (Brush)
Motor Actuator (BLDC)



- ◆ As the first generation of molded inductor, UPI series has below 6 advantages comparing with traditional assembled powder inductor(ferrite) :
1. Large current;
 2. Stable magnetic saturation;
 3. Temperature characteristic independent of ambient temp;
 4. Low audible noise;
 5. Slight magnetic disturbance;
 6. Good shock resistance



DRH0630: 6*6*3 mm



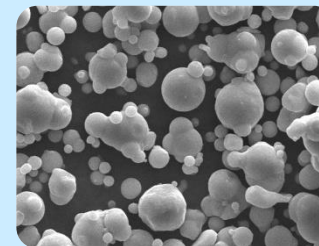
DRH105R: 10*10*5 mm

UPI Series

	L x W (mm)	Height-Max (mm)	L (uH)
UPI / UPIM / AUPI 06	7.1x6.6	2.4/3.0/4.0	0.22~22
UPI / UPIM / AUPI 08	8.6x8.1	2.4/3.0/4.0	0.22~47
UPI / UPIM / AUPI 10	11.0x10.0	3.0/4.0/5.0	0.22~47
UPI / UPIM / AUPI 12	13.4x12.6	3.0/5.0/7.0	0.22~47
UPI / UPIM / AUPI 15	15.7x15.0	4.0/8.0	0.22~47
UPI / UPIM / AUPI 17	17.3x17.0	4.0/7.0	0.22~100
UPI / UPIM / AUPI 22	22.5x22.0	13.0	0.22~100

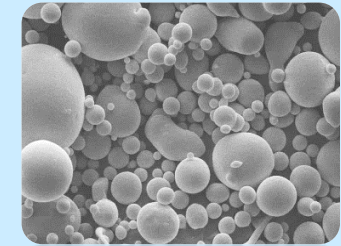
- ◆ Automotive-Grade series: 125°C UPIM (B/F) series / 155°C AUPI series

UPIMB

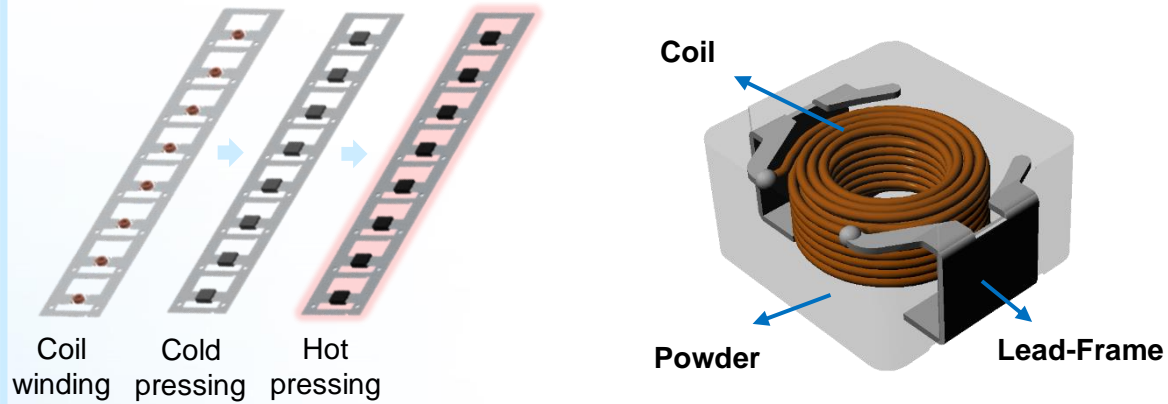


Carbonyl iron powder

UPIMF / AUPI



Alloy iron powder

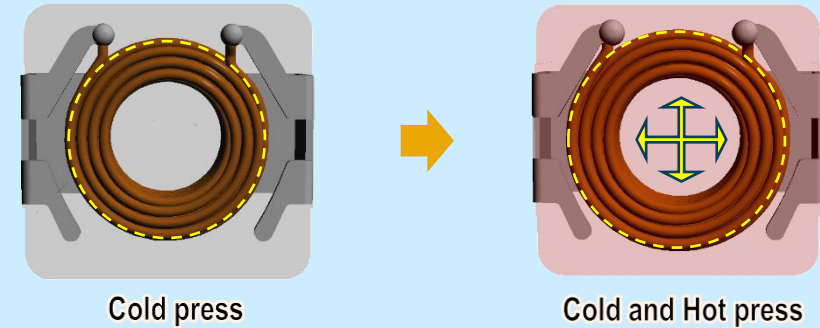


- ◆ Cold & Hot-press: Cold pressing goes through semi-finished product pressing in room-temperature as first step and then performs hot pressing(by mold heating) on semi-finished product. Semi-finished product stays in the heated mold for a short time after molding, which would heat and solidify the product surface. After that, product would go through baking and become solidified completely.
- ◆ The cold and hot press is upgraded and the pressure is around 50% of the cold press; less deform in the coil inside the product makes higher reliability.

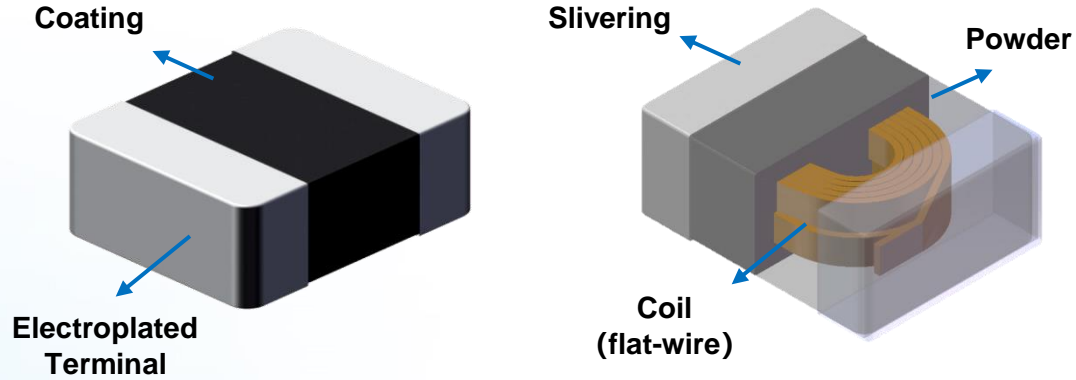
HPI Series

	L x W (mm)	Height-Max (mm)	L (uH)
HPI / HPIM / AHPI 03	3.4x3.0	1.0/1.2/1.5/2.0	0.12~10
HPI / HPIM / AHPI 04	4.4x4.0	1.0/1.2/1.5/2.0	0.12~22
HPI / HPIM / AHPI 05	5.5x5.2	1.0/1.2/1.5/2.0	0.12~22

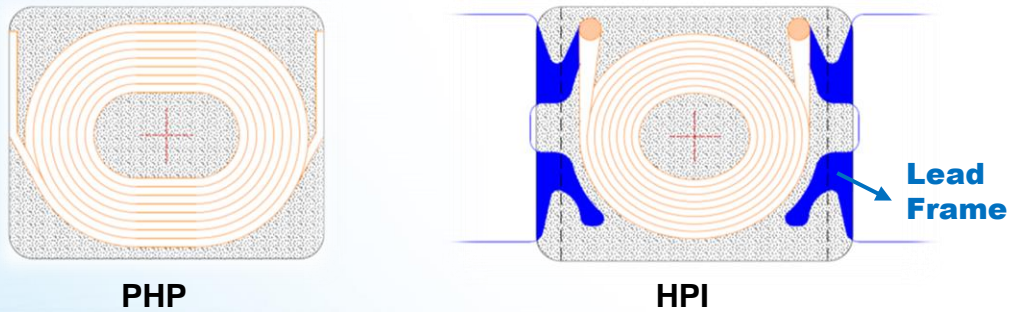
◆ Automotive-Grade series: 125°C HPIM series / 155°C AHPI series



- ◆ The coil can be designed to the limit by Cold & Hot-press. and make the Power Choke performance reach the best!



- ◆ The slivering terminals of PHP series pass terminal strength test of AEC-Q200.

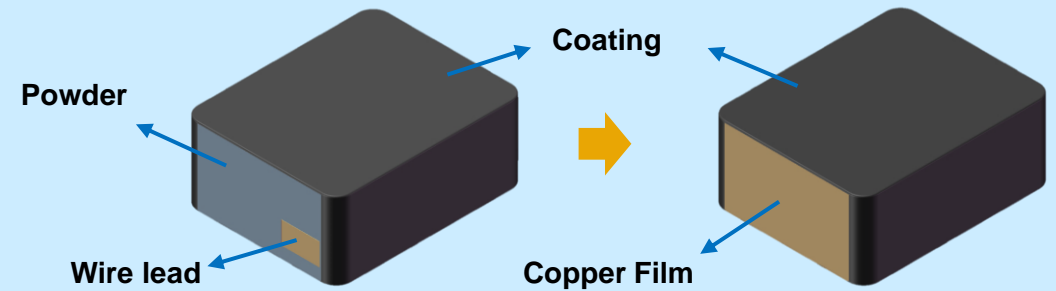


- ◆ The Coil of PHP series product could achieve better size without taking the space for Lead-Frame into consideration.

PHP Series

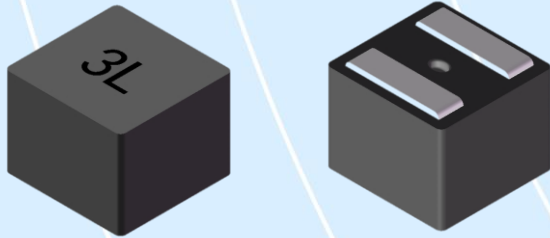
	L x W (mm)	Height-Max (mm)	L (uH)
PHP / PHPM / APHP 2016	2.0x1.6	1.0/1.2	0.22~4.7
PHP / PHPM / APHP 2520	2.5x2.0	1.0/1.2	0.22~10
PHP / PHPM / APHP 3225	3.2x2.5	1.0/1.2/2.0	0.22~10

- ◆ Automotive-Grade series: 125°C PHPM series / 155°C APHP series



- ◆ A larger copper wire outlet ensures good electrical conductivity.
- ◆ The copper lead area is increased to be the whole terminal surface, which increases the contact area of copper and silver paste to improve the reliability of terminals.

New Molding Power Inductor



TUP Series

04 / 05 / 06 / 07 / 08 / 10 / 15

Thickness max. 2.1mm ~ 13.0mm

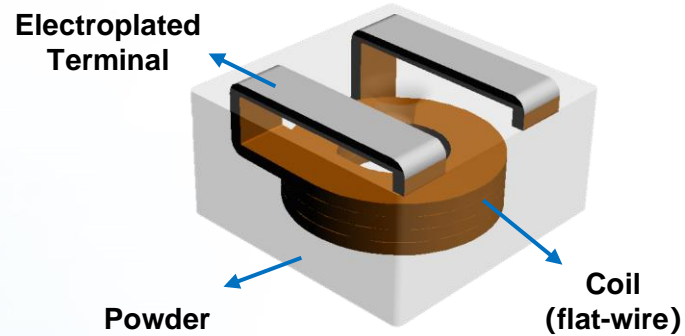
Magnetic Shielded

Low Loss & Low DCR

High Current & High Power

Wide frequency range from 100KHz~5MHz

***Fit for DC-DC converter / Server / PC and PC/NB/Phone Charger.
(TUPM and ATUP Series fit for automotive application)***



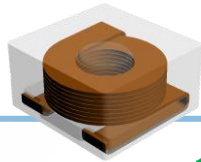
- ◆ With latest cold pressing and hot pressing technology, TUP series have the maximum powder density after pressing among all molded inductor series and achieve maximum U_i of core, which further improves the product electrical performance on the base of THP series product.
- ◆ Smaller molding pressure is used to achieve required product density, so the deformation rate of coil during molding is reduced.
- ◆ TUP has small compression ratio (TUP < HPI < UPI), which could reach very low defective rate of short/open to ensure high reliability and become the best automotive degree product.

TUP Series

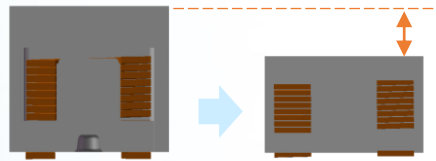
	L x W (mm)	Height-Max (mm)	L (uH)
TUP / TUPM / ATUP 04	4.1x4.1	2.1/3.0	0.10~6.80
TUP / TUPM / ATUP 05	5.5x5.3	2.1/3.1/5.0	0.15~22.0
TUP / TUPM / ATUP 06	6.6x6.4	3.1/5.0/6.0	0.12~22.0
TUP / TUPM / ATUP 07	7.8x7.6	2.1/3.1/7.0	0.27~8.20
TUP / TUPM / ATUP 08	8.9x8.5	8.0	1.80~10.0
TUP / TUPM / ATUP 10	11.9x11.0	3.1/6.0/10	0.28~15.0
TUP / TUPM / ATUP 15	16.5x15.5	8.0/10/13	2.00~33.0

- ◆ **Automotive-Grade series:** 125°C TUPM series / 155°C ATUP series

- ◆ Short/Open control of TUP series,
Defective rate of inductor short within 3L could be < 30 PPM and defective rate of inductor short at end user could be < 3 PPM ;
Defective rate of inductor open within 3L could be 0 PPM and defective rate of inductor open at end user could be 0 PPM;



Compression ratio: **1.50**



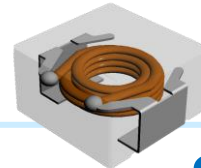
(Before - Pressing - After)

Copper wire diameter: 0.19mm*1.0mm
Vertical compression ratio of copper wire:

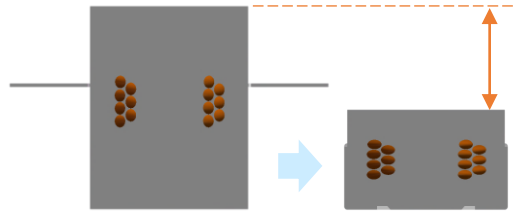
1.21

TUP0503-1R5M

L	1.5uH Typ.
DCR	8.1mΩ Typ.
Isat	14.0A Typ.
Irms	10.5A Typ.



Compression ratio: **2.04**



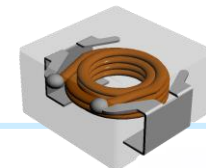
(Before - Pressing - After)

Copper wire diameter: $\phi 0.35\text{mm}$
Vertical compression ratio of copper wire:

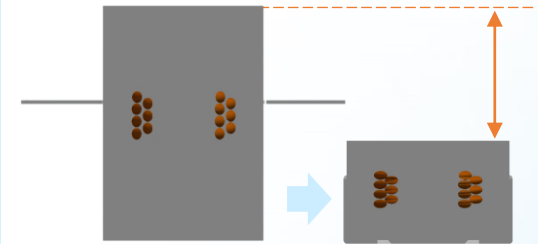
1.32

HPI0503-1R5M

L	1.5uH Typ.
DCR	15mΩ Typ.
Isat	12.0A Typ.
Irms	8.20A Typ.



Compression ratio: **2.32**



(Before - Pressing - After)

Copper wire diameter: $\phi 0.32\text{mm}$
Vertical compression ratio of copper wire:

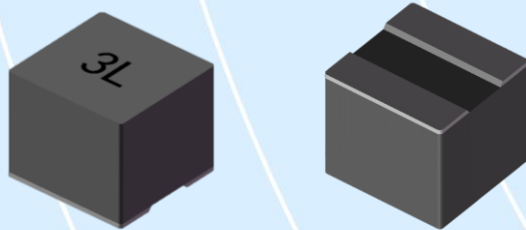
1.35

UPI0503-1R5M

L	1.5uH Typ.
DCR	18mΩ Typ.
Isat	10.0A Typ.
Irms	7.20A Typ.

Best performance! Highest reliability!

New Molding Power Inductor



BTU Series

04 / 05 / 06 / 07

Thickness max. 2.1mm ~ 7.0mm

Magnetic Shielded

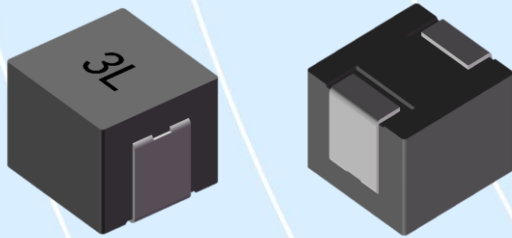
Low Loss & Low DCR

High current & High power by High-density powder

Operating Temperature Range -55°C to +155°C

Fit for DC-DC converter / Server / PC and PC/NB/Phone Charger.

New Molding Power Inductor



CTP Series

04 / 05 / 06 / 07

Thickness max. 2.1mm ~ 7.0mm

Magnetic Shielded

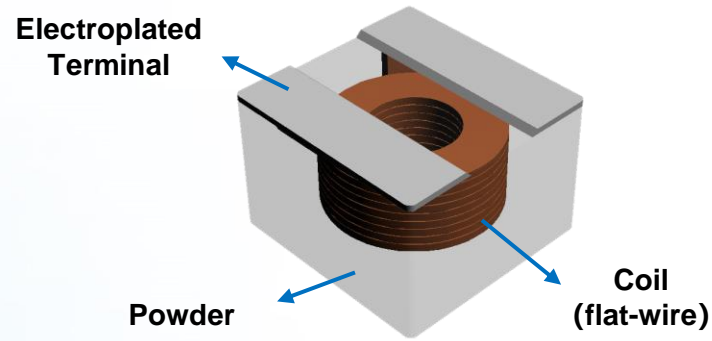
Low Loss & Low DCR

High current & High power by High-density powder

Operating Temperature Range -55°C to +155°C

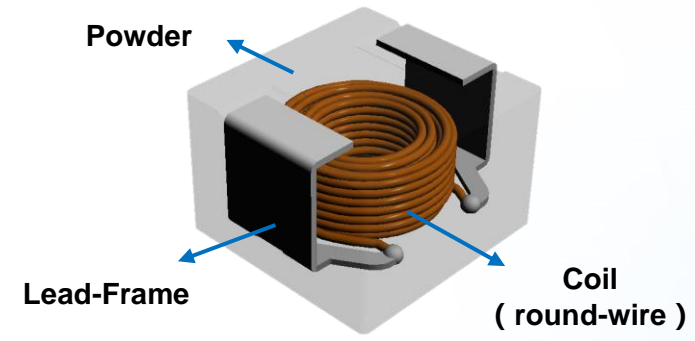
High reliability and High efficiency for automotive application

BTU Series



- ◆ Different from small PIN design of TUP series, BTU series have larger PIN, higher terminal strength, and better winding and forming technology. Comparing with TUP series, BTU series can adopt larger flat-wire winding to achieve lower DCR in low-inductance product.
- ◆ Smaller molding pressure is used to achieve required product density, so the deformation rate of coil during molding is reduced.
- ◆ BTU has small compression ratio($BTU = TUP < HPI < UPI$), which could reach very low defective rate of short/open to ensure high reliability and become the best automotive degree product.

CTP Series



- ◆ Different from flat-wire coil design of TUP series, round-wire soldered with copper strip is applied in CTP, which could achieve higher inductance(such as 100uH).
- ◆ Smaller molding pressure is used to achieve required product density, so the deformation rate of coil during molding is reduced.
- ◆ CTP has small compression ratio($CTP < HPI < UPI$), which could reach very low defective rate of short/open to ensure high reliability and become the best automotive degree product.

Category	Trend	2023 Q3Q4	2024 Q1Q2	2024 Q3Q4	2025 Q1Q2	2025 Q3Q4	2026 Q1Q2	
ATUP →Automotive(155°C) →Higher Operating Temperature →More Size	 →General(125°C) →Higher cost-efficiency (High Current & Low price) Preferred alternative to TUP	MP :Sep`2023 ATUP 0403 ATUP 0505 ATUP 0631 ATUP 0606	MP :Mar`2024 ATUP 0421 ATUP 0521 ATUP 0531 ATUP 0605	MP :Sep`2024 ATUP 0707 ATUP 0808	MP :Mar`2025 ATUP 0721 ATUP 0731	MP :Sep`2025 ATUP1010 ATUP1513	MP :Mar`2026 ATUP1031 ATUP1006 ATUP1508 ATUP1510	
				Automotive & More Size				
			MP :Mar`2024 BTU 0531	MP :Sep`2024 BTU 0521 BTU 0505	MP :Mar`2025 BTU 0606	MP :Sep`2025 BTU 0631 BTU 0605	MP :Mar`2026 BTU 0421 BTU 0403 BTU 0731 BTU 0707	
				General(125°C) & Higher cost-efficiency				
CTP →Automotive(155°C) →Higher Operating Temperature →Ultra high inductance					MP :Sep`2024 CTP 0530	MP :Mar`2025 CTP 0645	MP :Sep`2025 CTP 0754	MP :Mar`2026 CTP 0421
				Automotive & Ultra high inductance				

Laboratory of 3L Electronic(Zhongshan) Co.,Ltd is authorized to complete reliability test.

The image shows a CNAS (China National Accreditation Service for Conformity Assessment) recognition certificate. It features the logos of ILAC-MRA and CNAS. The text is in Chinese and includes the following information:

- 中国合格评定国家认可委员会 实验室认可证书** (China National Accreditation Service for Conformity Assessment Laboratory Accreditation Certificate)
- 注册号: CNAS L13436
- 兹证明: **中山市三礼电子有限公司实验室** (法人: 中山市三礼电子有限公司) **广东省中山市南朗镇第六工业区, 528451**
- 符合 ISO/IEC 17025: 2017 《检测和校准实验室能力的通用要求》(CNAS-CL01 《检测和校准实验室能力认可准则》) 的要求, 具备承担本证书附件所列服务能力, 予以认可。
- 获认可的能力范围见标有相同认可注册号的证书附件, 证书附件是本证书组成部分。
- 生效日期: 2020-08-17
截止日期: 2026-08-16
- 中国合格评定国家认可委员会授权人 (Signature)
- 中国合格评定国家认可委员会 (CNAS) 经国家认证认可监督管理委员会 (CNCA) 授权, 负责实施合格评定国家认可制度。CNAS 是国际实验室认可合作组织 (ILAC) 和亚太认可合作组织 (APAC) 的互认协议成员。本证书的有效性可登陆 www.cnas.org.cn 获认可的机构名录查询。



(Biased) Humidity test / Operational Life Test

Thermal shock Test



Low & High temperature Storage Test

Temperature Cycling Test

Vibration Test



THANKS

www.3lcoil.com