Shanghai YMIN Electronics Co., Ltd.

## Capacitor Solutions, Ask YMIN for your Applications

**Respond quickly and accurately to customer needs**

# AI SERVER

## SPECIAL CAPACITOR APPLICATION MANUAL

V2025.10

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# Qualification Certificate

## QUALIFICATION CERTIFICATE


NATIONAL MILITARY STANDARD QUALITY MANAGEMENT SYSTEM CERTIFICATION

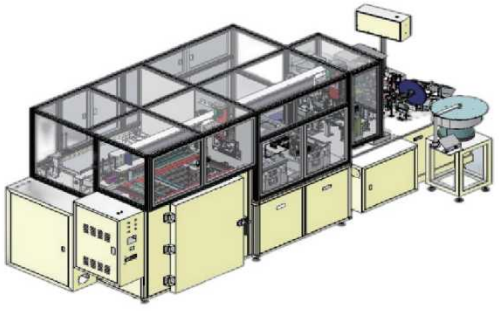

IATF 16949 SYSTEM CERTIFICATION


CNAS ACCREDITATION IS UNDERWAY...


AEC-Q200 PRODUCT CERTIFICATION

# Automated production line

## AUTOMATED PRODUCTION LINE



YMIN Electronics' all-capacitor production line is a high-end production line integrating automation, digitalization, and intelligence, ensuring product manufacturing quality and production efficiency.

The entire process is automated, connecting five core processes. Materials flow automatically, process parameters are intelligently matched, and equipment automation exceeds 90%, with human intervention less than 10%. Three-dimensional inspection integrates electrical performance testing, CCD vision, and laser measurement, with data uploaded to the cloud in real time, ensuring 100% effective rejection of defective products. The Industrial Internet of Things (IIoT) collects over 300 quality parameters in real time, and the MES system enables full-process traceability and equipment visualization.

# Product System Diagram

PRODUCT SYSTEM DIAGRAM

## Conductive polymer tantalum electrolytic capacitor

surface mount type

| TPB19 | TQB19 | TQD15 | TQD19 |
|---|---|---|---|
| 3.5×2.8×1.9mm<br>16V/33μF~100V/1.2μF<br>105℃ 2000H | 3.5×2.8×1.9mm<br>16V/47μF~100V/1.5μF<br>105℃ 2000H | 7.3×4.3×1.5mm<br>35V/47μF~63V/10μF<br>105℃ 2000H | 7.3×4.3×1.9mm<br>16V/220μF~35V/68μF<br>105℃ 2000H |

## Multilayer polymer solid aluminum electrolytic capacitor

surface mount type

| P17 MPS | P19 MPD19 |
|---|---|
| 7.3×4.3×1.9mm<br>2V/560~2.5V/470μF<br>105℃ 2000H | 7.3×4.3×1.9mm<br>2V/560μF~50V/10μF<br>105℃ 2000H |

## Polymer solid aluminum electrolytic capacitor

surface mount type

| VPC | VPW |
|---|---|
| 105℃ 2000H<br>2.5~16V<br>Ultra-low ESR, withstands high ripple current | 105℃, 15000H, 2.5~50V,<br>Ultra-long lifespan, High reliability |

Lead type

| NPC | NPM | NPL | NPX |
|---|---|---|---|
| 105℃ 2000H<br>2.5~16V<br>Ultra-low ESR, withstands high ripple current | 105℃ 2000H6.3~100V<br>High-frequency, high ripple current withstandLow ESR<br>3.55mm/4mm diameter | 105℃ 5000H 6.3~100V<br>High-frequency, high ripple current withstand<br>Low ESR, long lifespan | 105℃ 2000H 6.3~100V<br>High-frequency, high ripple current withstandLow ESR,<br>miniaturized product |

## Polymer hybrid aluminum electrolytic capacitor

surface mount type

**VHT**

125℃ 4000H16~100V
High reliability, low ESR
High ripple current tolerance, high temperature resistance
Surface mount component

Lead type

**NHX**

105℃, 2000H~5000H,16~160V,
High withstand voltage,
Long life, High permissible ripple current.

→

**NGY**

105℃ 10000H 16~80V
High reliability, low ESR
High tolerable ripple current, long lifespan

→

**NHT**

125℃ 4000H 16~80V
High reliability, low ESR
High tolerable ripple current, high temperature resistance

## Liquid aluminum electrolytic capacitor

Lead type

**LKF**

105℃
10000H
High ripple current
Low impedance
Standard product

→

**LKM**

105℃
10000H
High ripple current
Low impedance
Miniaturization

→

**LKL**

130℃
5000H
High-temperature resistant, long-life product

Base plate independent type

**IDC3**

105℃ 3000H
450~500V High Capacitance Density

## Lithium-ion supercapacitors

Square unit

**SLF**

-30℃~+70℃
4V 2200F
148*67.0*17.8

**SLF**

-30℃~+70℃
4V 4500F
148×92.5×17.8

Square module

**SLM**

-30℃~+70℃
24V 433F
118*35*46

**SLM**

-30℃~+70℃
4V 25000F
160*115*165

# AI Server Motherboard & Graphics Card

SMART MOBILITY

IMAGE FOR REFERENCE ONLY.

MOTHERBOARD

GRAPHICS CARD

## Graphics Processing Unit (GPU), Central Processing Unit (CPU)

### Application Requirements

Ultra-low ESR, high energy density, excellent high-frequency characteristics, high stability, high temperature reliability, miniaturization, and high-density mounting.

### Yongming Multilayer Solid Aluminum Capacitor Product Advantages

**Ultra-low ESR**

① High ESR consistency contributes to low power consumption and high energy efficiency of the entire system. ② The maximum ESR of the MPS series is only 3mΩ.

**High energy density**

① Capacitance up to 820μF 2V within a D-shell size. ② Ensures sufficient charge reserve within a limited space;

**High temperature reliability**

① Capacity change of no more than 5% between -55℃ and +105℃ ② Capacity change of no more than -10% after long-term operation. This ensures stable operation of the server under high load and high temperature conditions 24/7, reducing failure rate and maintenance requirements, and adapting to the harsh environment of data centers.

**Excellent high-frequency characteristics**

① Adaptable to high frequencies of 100~300KHz; ② Ensures consistent high-frequency filtering performance of the server under different temperature conditions, making the system design more reliable;

### Recommended selection (the following are sample specifications for reference only)

| Capacitor type | shape | series | Temperature life | Rated Voltage (Surge Voltage) (V) | Nominal capacity (μF) | Product dimensions (mm) | Tan (120HZ) | ESR (mΩ/100kHz) | Rated ripple current (mA/100kHz) | LC (μA) | Product Part Number |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Multilayer polymer solid aluminum electrolytic capacitor | surface mount type | MPS | 105℃ 2000H | 2 (2.5) | 560 | 7.3*4.3*1.9 | 0.06 | 3 | 10200 | 112 | MPS561M0DD19003R |
| | | MPS | 105℃ 2000H | 2 (2.5) | 680 | 7.3*4.3*1.9 | 0.06 | 3 | 10200 | 136 | MPS681M0DD19003R |
| | | MPS | 105℃ 2000H | 2 (2.5) | 820 | 7.3*4.3*2.8 | 0.06 | 3 | 10200 | 164 | MPS821M0DD19003R |
| | | MPS | 105℃ 2000H | 2.5 (3.12) | 470 | 7.3*4.3*1.9 | 0.06 | 3 | 10200 | 118 | MPS471M0ED19003R |

## Recommended selection (the following are sample specifications for reference only)

| Capacitor type | shape | series | Temperature life | Rated Voltage (Surge Voltage) (V) | Nominal capacity (μF) | Product dimensions (mm) | Tan (120HZ) | ESR (mΩ/100kHz) | Rated ripple current (mA/100kHz) | LC (μA) | Product Part Number |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Multilayer polymer solid aluminum electrolytic capacitor | surface mount type | MPS | 105℃ 2000H | 2.5 (3.12) | 560 | 7.3*4.3*1.9 | 0.06 | 3 | 10200 | 139 | MPS561M0ED19003R |
| | | MPS | 105℃ 2000H | 2.5 (3.12) | 680 | 7.3*4.3*2.8 | 0.06 | 3 | 10200 | 170 | MPS681M0ED19003R |
| | | MPD19 | 105℃ 2000H | 2 (2.5) | 560 | 7.3*4.3*1.9 | 0.06 | 4.5 | 8500 | 112 | MPD561M0DD194R5R |
| | | MPD19 | 105℃ 2000H | 2 (2.5) | 680 | 7.3*4.3*1.9 | 0.06 | 4.5 | 8500 | 136 | MPD681M0DD194R5R |
| | | MPD19 | 105℃ 2000H | 2 (2.5) | 820 | 7.3*4.3*2.8 | 0.06 | 4.5 | 8500 | 164 | MPD821M0DD194R5R |
| | | MPD19 | 105℃ 2000H | 2.5 (3.12) | 470 | 7.3*4.3*1.9 | 0.06 | 4.5 | 8500 | 118 | MPD471M0ED194R5R |
| | | MPD19 | 105℃ 2000H | 2.5 (3.12) | 560 | 7.3*4.3*1.9 | 0.06 | 4.5 | 8500 | 139 | MPD561M0ED194R5R |
| | | MPD19 | 105℃ 2000H | 2.5 (3.12) | 680 | 7.3*4.3*2.8 | 0.06 | 4.5 | 8500 | 170 | MPD681M0ED194R5R |

# DC-DC converter

## Application Requirements

Ultra-low ESR, high permissible ripple current; miniaturization, high capacity density; high reliability & wide temperature range and long lifespan;

## Yongming Solid Capacitor Product Advantages

### Ultra-low ESR (ultra-high permissible ripple current)

Utilizing a high-conductivity electrolyte and optimized electrode structure, it achieves ultra-low ESR characteristics. It possesses excellent high-frequency response and ripple resistance, significantly reducing energy loss and temperature rise, ensuring stable operation of equipment under high-temperature conditions.

### Miniaturization/High Capacity Density

By breaking through product size limits with innovative materials and structural design, we achieve industry-leading miniaturization packaging under the same capacitance conditions, helping to realize high-density PCB layout and freeing up valuable space.

### High reliability & wide temperature range and long

With a wide temperature range of -55℃ to +105℃, the server maintains stable performance with a capacity change of no more than 5%, ensuring 24/7 high-load operation. It also operates stably in high-temperature environments with extremely low capacity decay, reducing failure rates and maintenance requirements, and adapting to the harsh environment of data centers.

## Recommended selection (the following are sample specifications for reference only)

| Capacitor type | shape | series | Temperature life | Rated Voltage (Surge Voltage) (V) | Nominal capacity (μF) | Product dimensions (mm) | Tan (120HZ) | ESR (mΩ/100kHz) | Rated ripple current (mA/100kHz) | LC (μA) | Product Part Number |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Polymer solid aluminum electrolytic capacitor | Lead type | NPC | 105℃ 2000H | 2.5 (2.9) | 560 | 6.3*5.7 | 0.08 | 10 | 3500 | 300 | NPCC0570E561MJTM |
| | | NPC | 105℃ 2000H | 2.5 (2.9) | 1000 | 8*8 | 0.08 | 7 | 6100 | 500 | NPCD0800E102MJTM |
| | | NPC | 105℃ 2000H | 2.5 (2.9) | 1200 | 8*8 | 0.09 | 7 | 6100 | 600 | NPCD0800E122MJTM |
| | | NPC | 105℃ 2000H | 6.3 (7.2) | 330 | 6.3*5.7 | 0.08 | 15 | 3100 | 416 | NPCC0570J331MJTM |
| | | NPC | 105℃ 2000H | 6.3 (7.2) | 680 | 8*8 | 0.08 | 8 | 5600 | 857 | NPCD0800J681MJTM |
| | | NPC | 105℃ 2000H | 6.3 (7.2) | 1500 | 8*11 | 0.09 | 7 | 6150 | 1890 | NPCD1100J152MJTM |
| | | NPC | 105℃ 2000H | 16 (18.4) | 100 | 6.3*5.7 | 0.08 | 20 | 2700 | 320 | NPCC0571C101MJTM |
| | | NPC | 105℃ 2000H | 16 (18.4) | 270 | 6.3*7 | 0.08 | 15 | 4300 | 864 | NPCC0701C271MJTM |
| | surface mount type | VPC | 105℃ 2000H | 2.5 (2.9) | 560 | 6.3*5.8 | 0.08 | 10 | 3500 | 500 | VPCC0580E561MVTM |
| | | VPC | 105℃ 2000H | 2.5 (2.9) | 1000 | 8*9 | 0.08 | 7 | 6100 | 500 | VPCD0900E102MVTM |
| | | VPC | 105℃ 2000H | 2.5 (2.9) | 1200 | 8*9 | 0.09 | 7 | 6100 | 600 | VPCD0900E122MVTM |
| | | VPC | 105℃ 2000H | 6.3 (7.2) | 330 | 6.3*5.8 | 0.08 | 15 | 3100 | 500 | VPCC0580J331MVTM |
| | | VPC | 105℃ 2000H | 6.3 (7.2) | 680 | 8*9 | 0.08 | 8 | 5600 | 857 | VPCD0900J681MVTM |
| | | VPC | 105℃ 2000H | 6.3 (7.2) | 1500 | 8*12.5 | 0.09 | 7 | 6150 | 1890 | VPCD1250J152MVTM |
| | | VPC | 105℃ 2000H | 16 (18.4) | 100 | 6.3*5.8 | 0.08 | 20 | 2700 | 500 | VPCC0581C101MVTM |
| | | VPC | 105℃ 2000H | 16 (18.4) | 270 | 6.3*7.7 | 0.08 | 15 | 4300 | 864 | VPCC0771C271MVTM |
| | | VPW | 105℃ 15000H | 2.5 (2.9) | 560 | 6.3*6.1 | 0.12 | 15 | 3200 | 500 | VPWC0610E561MVTM |
| | | VPW | 105℃ 15000H | 2.5 (2.9) | 820 | 6.3*8.5 | 0.12 | 13 | 3600 | 500 | VPWC0850E821MVTM |
| | | VPW | 105℃ 15000H | 2.5 (2.9) | 1000 | 8*9 | 0.12 | 7 | 6100 | 500 | VPWD0900E102MVTM |
| | | VPW | 105℃ 15000H | 2.5 (2.9) | 1200 | 8*9 | 0.13 | 7 | 6100 | 600 | VPWD0900E122MVTM |
| | | VPW | 105℃ 15000H | 6.3 (7.2) | 330 | 6.3*6.1 | 0.12 | 16 | 3100 | 500 | VPWC0610J331MVTM |
| | | VPW | 105℃ 15000H | 6.3 (7.2) | 680 | 8*9 | 0.12 | 8 | 5700 | 857 | VPWD0900J681MVTM |
| | | VPW | 105℃ 15000H | 6.3 (7.2) | 1000 | 8*9 | 0.12 | 8 | 5700 | 1260 | VPWD0900J102MVTM |
| | | VPW | 105℃ 15000H | 16 (18.4) | 100 | 6.3*6.1 | 0.12 | 30 | 2200 | 500 | VPWC0611C101MVTM |
| Multilayer polymer solid aluminum electrolytic capacitor | surface mount type | MPD19 | 105℃ 2000H | 25 (28.75) | 33 | 7.3*4.3*1.9 | 0.06 | 40 | 3200 | 83 | MPD330M1ED19040R |
| | | MPD19 | 105℃ 2000H | 6.3 (7.2) | 220 | 7.3*4.3*1.9 | 0.06 | 9 | 6300 | 139 | MPD221M0LD19009R |

# DC-DC converter

## Application Requirements

Ultra-small package & high-density mounting; high temperature resistance & long lifespan; excellent high-frequency characteristics & high reliability;

## YMIN Polymer Tantalum Capacitor Product Advantages

### Ultra-small package & high-density mounting

Industry-leading miniaturized packaging delivers maximum volumetric capacity within minimal physical space. It is the preferred solution for space-constrained scenarios such as high-density motherboard layouts and back-mounted chips, effectively freeing up valuable PCB area.

### High temperature resistance & long lifespan

The entire series supports a 105℃ 2000H lifespan test. This ensures stable performance under long-term high-temperature baking, with an actual working lifespan far exceeding the server's design life, providing "one-time design, lifetime peace of mind" reliability;

### Excellent high-frequency characteristics & high reli-

The high-frequency response ensures fast high-frequency response capability while effectively avoiding huge power-on surge current caused by excessively low ESR, significantly improving the safety and reliability of system hot-swapping and frequent power-on and power-off, and providing a solid guarantee for applications.

## Recommended selection (the following are sample specifications for reference only)

| Capacitor type | shape | series | Temperature life | Rated Voltage (Surge Voltage) (V) | Nominal capacity (μF) | Product dimensions (mm) | Tan (120HZ) | ESR (mΩ/100kHz) | Rated ripple current (mA/100kHz) | LC (μA) | Product Part Number |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Conductive polymer Tantalum electrolytic capacitor | surface mount type | TPB19 | 105℃ 2000H | 16 (18.4) | 47 | 3.5*2.8*1.9 | 0.10 | 100 | 1100 | 75.2 | TPB470M1CB19100RN |
| | | TPB19 | 105℃ 2000H | 25 (28.8) | 22 | 3.5*2.8*1.9 | 0.10 | 100 | 900 | 55 | TPB220M1EB19100RN |
| | | TQD19 | 105℃ 2000H | 16 (18.4) | 100 | 7.3*4.3*1.9 | 0.10 | 100 | 1400 | 160 | TQB101M1CD19100RN |
| | | TQD19 | 105℃ 2000H | 16 (18.4) | 150 | 7.3*4.3*1.9 | 0.10 | 100 | 1400 | 240 | TQB151M1CD19100RN |
| | | TQD19 | 105℃ 2000H | 25 (28.8) | 100 | 7.3*4.3*1.9 | 0.10 | 100 | 1400 | 250 | TQB101M1ED19100RN |

# AI Server Power Supply

AI SERVER POWER SUPPLY

MAIN POWER SUPPLY

BBU BACKUP POWER

## Main power supply - low voltage output terminal

### Application Requirements

Ultra-low equivalent series resistance (ESR); high ripple current withstand capability; excellent temperature characteristics and long lifespan; high reliability and stability;

### YMIN Solid Capacitor Product Advantages

**Ultra-low equivalent series resistance**

① YMIN solid-state capacitors feature extremely low equivalent series resistance (ESR), enabling them to quickly respond to drastic load changes in AI server chips, rapidly absorb large ripple currents, ensure highly stable output voltage, and reduce interference.

② The ultra-low ESR characteristic also reduces the capacitor's own heat generation, improving overall energy efficiency and making it suitable for high-frequency switching power supply designs.

**High ripple current withstand capability**

① YMIN capacitors utilize advanced materials and process design to provide excellent ripple resistance, supporting high ripple applications and ensuring the reliability of power systems under ultra-high ripple current and transient changes.

② This product can withstand extremely high ripple current. Even under the huge current fluctuations during AI server power supply operation, it will not overheat and fail due to large ripple current, ensuring stability and long lifespan under extreme load conditions.

**Excellent temperature characteristics and long lifespan**

① YMIN solid-state capacitors exhibit stable performance over a wide temperature range (-55° C to +125° C), demonstrating excellent high-temperature characteristics and a lifespan of 5-10 years. They are suitable for the demanding environments of AI servers operating 24/7.

② Capacitor performance exhibits minimal degradation at high temperatures, ensuring stable operation of the server power supply across various temperatures and guaranteeing long-term maintenance-free operation.

**High reliability and stability**

① The product boasts high reliability and stability, capable of withstanding high voltage and high current surges (e.g., a single capacitor can withstand surge currents exceeding 20A), preventing system problems caused by instantaneous high current overload (such as blue screens, restarts, or graphics card screen flickering).

② It exhibits stable voltage withstand capability, stable ripple resistance, and consistent normal and transient response, ensuring long-term system reliability under harsh operating conditions; the product undergoes rigorous quality testing to ensure consistent performance under various environmental conditions.

## Recommended selection (the following are sample specifications for reference only)

| Capacitor type | shape | series | Temperature life | Rated Voltage (Surge Voltage) (V) | Nominal capacity (μF) | Product dimensions ΦD*L (mm) | Tan (120HZ) | ESR (mΩ/100kHz) | Rated ripple current (mA/100kHz) | LC (μA) | Product Part Number |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Polymer solid aluminum electrolytic capacitor | Lead type | NPL | 105℃ 5000H | 63 (72.5) | 100 | 10*10 | 0.12 | 50 | 2500 | 1260 | NPLE1001J101MJTM |
| | | NPL | 105℃ 5000H | 63 (72.5) | 220 | 8*20 | 0.12 | 25 | 2950 | 2772 | NPLD2001J221MJTM |
| | | NPL | 105℃ 5000H | 63 (72.5) | 470 | 10*21 | 0.12 | 30 | 4350 | 5922 | NPLE2101J471MJTM |
| | | NPL | 105℃ 5000H | 63 (72.5) | 680 | 10*30 | 0.12 | 20 | 5200 | 7500 | NPLE3001J681MJTM |
| | | NPL | 105℃ 5000H | 80 (92) | 100 | 10*16 | 0.12 | 30 | 3800 | 1600 | NPLE1601K101MJTM |
| | | NPL | 105℃ 5000H | 80 (92) | 150 | 12.5*16 | 0.12 | 30 | 4300 | 2400 | NPLL1601K151MJTM |
| | | NPL | 105℃ 5000H | 80 (92) | 330 | 12.5*20 | 0.12 | 30 | 4550 | 5280 | NPLL2001L331MJTM |
| | | NPX | 105℃ 2000H | 63 (72.5) | 470 | 10*21 | 0.12 | 30 | 4350 | 5922 | NPXE2101J471MJTM |
| Polymer Hybrid Power Aluminum Electrolytic Capacitor | Lead type | NHT | 125℃ 4000H | 63 (72.5) | 120 | 10*10 | 0.10 | 30 | 1400 | 76 | NHTE1001J121MJCG |
| | | NHT | 125℃ 4000H | 63 (72.5) | 270 | 10*16 | 0.10 | 12 | 3500 | 170 | NHTE1601J271MJCG |
| | | NHT | 125℃ 4000H | 63 (72.5) | 390 | 10*25 | 0.10 | 12 | 4350 | 246 | NHTE2501J391MJCG |
| | | NHT | 125℃ 4000H | 80 (92) | 47 | 10*10 | 0.10 | 35 | 1200 | 38 | NHTE1001K470MJCG |
| | surface mount type | VHT | 125℃ 4000H | 63 (72.5) | 150 | 10*13 | 0.10 | 20 | 2200 | 95 | VHTE1301J151MVCG |
| | | VHT | 125℃ 4000H | 63 (72.5) | 180 | 10*13 | 0.12 | 20 | 2200 | 113 | VHTE1301J181MVCG |
| | | VHT | 125℃ 4000H | 63 (72.5) | 220 | 10*17 | 0.12 | 12 | 3500 | 139 | VHTE1701J221MVCG |
| | | VHT | 125℃ 4000H | 80 (92) | 10 | 6.3*5.8 | 0.1 | 120 | 700 | 8 | VHTC0581K100MVCG |
| | | VHT | 125℃ 4000H | 80 (92) | 47 | 10*10.5 | 0.10 | 35 | 1200 | 38 | VHTE1051K470MVCG |
| Liquid aluminum electrolytic capacitors | Lead type | LKL | 130℃ 5000H | 63 (79) | 470 | 14.5*16 | 0.09 | 112 | 1500 | 296 | LKLU1601J471MF |
| | | LKL | 130℃ 5000H | 63 (79) | 680 | 14.5*23 | 0.09 | 78 | 1610 | 428 | LKLU2301J561MF |
| | | LKL | 130℃ 5000H | 63 (79) | 1000 | 14.5*27 | 0.09 | 45 | 1850 | 630 | LKLU2701J102MF |
| | | LKL | 130℃ 5000H | 63 (79) | 1200 | 12.5*30 | 0.09 | 40 | 2300 | 756 | LKLL3001J122MF |
| | | LKL | 130℃ 5000H | 63 (79) | 2700 | 18*30 | 0.11 | 33 | 3100 | 1701 | LKLJ3001J272MF |
| | | LKL | 130℃ 5000H | 63 (79) | 1300 | 16*35.5 | 0.09 | 35 | 3120 | 819 | LKLI3551J132MF |

# Main power supply - high voltage input terminal

## Application Requirements

High capacity density (miniaturization, large capacity); higher withstand voltage and reliability; extremely high ripple current withstand capability; lower equivalent series resistance (ESR);

## YMIN Liquid Aluminum Electrolytic Capacitor Product Advantages

### Ultra-high capacity and energy density

A single chip can provide a large amount of electrical capacity, serving as an efficient "energy reservoir" to buffer the instantaneous high power

### High ripple current withstand capability

AI server power supplies experience significant current ripple during operation. This product can withstand extremely high ripple current without

### High pressure resistance and reliability

With a high rated voltage (e.g., above 450V), it can operate stably in a PFC-level high-voltage DC bus, providing a reliable foundation for

### Low ESR

Its low ESR (equivalent series resistance) characteristic enables it to respond quickly to drastic changes in the load of AI chips, rapidly

### Cost-effectiveness

While achieving the same capacity and voltage rating, liquid horn capacitors typically offer a greater cost advantage compared to stacking multiple small capacitors or using other technologies.

## Recommended selection (the following are sample specifications for reference only)

| Capacitor type | shape | series | Temperature life | Rated Voltage (Surge Voltage) (V) | Nominal capacity (μF) | Product dimensions ΦD*L (mm) | Tan (120HZ) | ESR (mΩ/120kHz) | Rated ripple current (mA/120kHz) | LC (μA) | Product Part Number |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Liquid aluminum electrolytic capacitors | substrate self-reliant | IDC3 | 105℃ 3000H | 450 (500) | 1000 | 30*60 | 0.15 | 301 | 1960 | 940 | IDC32W102MNNXS09S2 |
| | | IDC3 | 105℃ 3000H | 450 (500) | 1200 | 30*65 | 0.15 | 252 | 2370 | 940 | IDC32W122MNNXS10S2 |
| | | IDC3 | 105℃ 3000H | 450 (500) | 1400 | 30*70 | 0.15 | 215 | 2750 | 940 | IDC32W142MNNXG01S2 |
| | | IDC3 | 105℃ 3000H | 450 (500) | 1600 | 30*80 | 0.15 | 188 | 3140 | 940 | IDC32W162MNNXG03S2 |
| | | IDC3 | 105℃ 3000H | 475 (525) | 1100 | 30*65 | 0.2 | 273 | 2360 | 940 | IDC32Y112MNNXS10S2 |
| | | IDC3 | 105℃ 3000H | 500 (550) | 1300 | 30*75 | 0.2 | 261 | 3350 | 940 | IDC32H132MNNXG02S2 |
| | | IDC3 | 105℃ 3000H | 500 (550) | 1500 | 30*85 | 0.2 | 226 | 3750 | 940 | IDC32H152MNNXG04S2 |
| | | IDC3 | 105℃ 3000H | 500 (550) | 1700 | 30*95 | 0.2 | 199 | 4120 | 940 | IDC32H172MNNXG06S2 |
| | Lead type | LKF | 105℃ 10000H | 450 (500) | 120 | 18*35.5 | 0.12 | 310 | 1900 | 910 | LKFJ3552W121MF |
| | | LKF | 105℃ 10000H | 500 (550) | 220 | 16*60 | 0.2 | 220 | 2100 | 2210 | LKFJ6002H221FF |
| | | LKF | 105℃ 10000H | 450 (500) | 82 | 14.5*27 | 0.12 | 380 | 860 | 748 | LKFU2702W820MF |
| | | LKF | 105℃ 10000H | 500 (550) | 56 | 14.5*25 | 0.2 | 250 | 750 | 570 | LKFU2502H560MF |

# BBU backup power

## Application Requirements

Ultra-high power density and instantaneous discharge capability; ultra-long cycle life and calendar life; space efficiency and energy density; extremely high reliability and safety;

## Advantages of YMIN Hybrid Supercapacitors

### Extremely low internal resistance, ultra-high magnification

It achieves ultra-low DC internal resistance (DC-IR < 0.8mΩ) and can withstand instantaneous pulse discharge of >100C, perfectly meeting the instantaneous peak power requirements of computing units such as NVIDIA GPUs, ensuring that computing power does not decrease due to power supply issues.

### >500,000 cycle life

The LIC (Lithium-ion Battery) combines the advantages of both batteries and capacitors. Its positive electrode material undergoes no phase change reaction, and the lithium intercalation process at the negative electrode is stable. This allows it to achieve a cycle life more than 10 times longer than lithium-ion batteries under shallow charge and discharge conditions, matching the lifespan of servers and enabling maintenance-free operation.

### Square structure, ultra-thin design

The square Prismatic structure allows for over 95% space utilization of the cells within the module, eliminating the waste issues associated with cylindrical cells. Combined with ultra-high energy density (>20Wh/L), our BBU module can achieve peak power of over 20kW within a 1U height, reducing volume and weight by more than 50% compared to traditional lithium-ion battery BBUs.

### High security and reliability

① Thermal stability is far superior to that of battery cathode materials, fundamentally eliminating thermal runaway.

② Structural safety: The robust square metal casing ensures safety.

③ Comprehensive certifications: Compliant with RoHS and REACH directives, and currently pursuing UL810A certification, safeguarding data center security.

### Wide temperature range

Stable operation from -30℃ to +70℃, optimized electrolyte formula and electrode system ensure that the product maintains excellent performance in both high-temperature server rack environments and cold regions, with high capacity retention and low self-discharge.

### Supports high-current fast charging

It features symmetrical charge and discharge characteristics, supports high-current charging above 20C, and can quickly restore energy within minutes to prepare for the next power challenge.

## Recommended selection (the following are sample specifications for reference only)

| Capacitor type | shape | series | Temperature life | Rated Voltage (Surge Voltage) (V) | Nominal capacity (F) | Product dimensions (mm) | Minimum operating voltage (V) | DC internal resistance (DC-ESR mΩ / 100kHz) | Continuous charge/ discharge current (A) | Maximum peak discharge current (A) | Product Part Number |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hybrid Supercapacitor | Square unit | SLF | -30℃~+70℃ 1000H | 4 (4.15) | 4500 | 148×92.5×17.8 | 2.5 | 0.8 | 200 | 1300 | SLF4.0V4500F |
| | | SLF | -30℃~+70℃ 1000H | 4 (4.15) | 2200 | 148*67.0*17.8 | 2.5 | 1 | 100 | 1000 | SLF4.0V2200F |
| | Square module | SLM | -30℃~+70℃ 1000H | 24 | 433 | 118*35*46 | 15 | 180 | 12 | 40 | SLM24V433FREA |
| | | SLM | -30℃~+70℃ 1000H | 4 (4.15) | 25000 | 160*115*165 | 2.5 | 0.8 | 200 | 1300 | SLM4.0V25000FREA |

# AI server storage

AI SERVER STORAGE


SSD ENTERPRISE-GRADE SOLID STATE DRIVE

## SSD Enterprise-grade Solid State Drive

### Application Requirements

Reliability of Power Outage Protection (PLP); resistance to high-frequency switching impulses; long lifespan and stability under high-temperature environments; high ripple current withstand capability; high reliability and consistency;

### YMIN's advantages in solid-liquid hybrid capacitors

**Power failure protection**

Solid hybrid capacitors can provide millisecond-level power-off protection, and ultra-low ESR ensures efficient energy release, perfectly meeting PLP requirements;

**Resistant to switch impact**

YMIN solid hybrid capacitors can withstand 300,000 charge-discharge cycles;

**High temperature and long life**

By adopting solid-liquid hybrid technology, the problem of electrolyte drying is fundamentally solved, and the lifespan is 4,000 hours at a high temperature of 125° C, far exceeding the expected working life of AI servers;

**High ripple current withstand**

Solid-liquid hybrid capacitors have high ripple current tolerance and can maintain system stability under heavy loads;

**High reliability and consistency**

YMIN utilizes intelligent production lines and a digital management platform to implement strict quality control, providing high-quality, consistent products that meet the ultimate reliability demands of enterprise customers.

### Recommended selection (the following are sample specifications for reference only)

| Capacitor type | shape | series | Temperature life | Rated Voltage (Surge Voltage) (V) | Nominal capacity (μF) | Product dimensions ΦD*L (mm) | Tan (120HZ) | ESR (mΩ/100kHz) | Rated ripple current (mA/100kHz) | LC (μA) | Product Part Number |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Polymer solid aluminum electrolytic capacitor | Lead type | NPM | 105℃ 2000H | 35 (41) | 56 | 4*11 | 0.12 | 100 | 950 | 392 | NPMA1101V560MJTM |
| | | NPM | 105℃ 2000H | 35 (41) | 68 | 4*11 | 0.12 | 100 | 950 | 476 | NPMA1101V680KJTM |
| Polymer Hybrid Power Aluminum Electrolytic Capacitor | Lead type | NGY | 105℃ 10000H | 35 (41) | 100 | 5*11 | 0.12 | 60 | 1250 | 35 | NGYB1101V101KJCG |
| | | NGY | 105℃ 10000H | 35 (41) | 120 | 5*12 | 0.12 | 60 | 1300 | 42 | NGYB1201V121KJCG |

## Recommended selection (the following are sample specifications for reference only)

| Capacitor type | shape | series | Temperature life | Rated Voltage (Surge Voltage) (V) | Nominal capacity (μF) | Product dimensions ΦD*L (mm) | Tan (120HZ) | ESR (mΩ/100kHz) | Rated ripple current (mA/100kHz) | LC (μA) | Product Part Number |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Polymer Hybrid Power Aluminum Electrolytic Capacitor | Lead type | NHX | 105℃ 2000H | 35 (41) | 220 | 5*15 | 0.12 | 40 | 2600 | 77 | NHXB1501V221KJCG |
| | | NHT | 125℃ 4000H | 35 (41) | 1800 | 12.5*20 | 0.13 | 16 | 4500 | 630 | NHTL2001V182KJCG |
| | | NHX | 105℃ 5000H | 35 (41) | 2200 | 12.5*20 | 0.14 | 16 | 4250 | 770 | NHXL2001V222MJCG |
| | | NHX | 105℃ 5000H | 35 (41) | 2700 | 12.5*25 | 0.14 | 16 | 4750 | 945 | NHXL2501V272MJCG |

# Data storage disk

## Application Requirements

Reliability of Power Outage Protection (PLP); resistance to high-frequency switching impulses; long lifespan and stability under high-temperature environments; high ripple current withstand capability; high reliability and consistency;

## YMIN Liquid Aluminum Electrolytic Capacitor Product Advantages

**Ultra-high capacity density**

Achieving greater energy storage on compact SSD boards without sacrificing layout or increasing costs for power-loss protection circuitry helps create more competitive high-density storage products.

**Ultra-small ESR**

Guarantee ultimate performance and prevent data loss. Ensure 100% data security for customers' high-end PCIe 5.0 SSDs in the event of a sudden power outage.

**Ultra-low leakage current**

The low leakage current characteristic greatly reduces this unnecessary energy loss, thereby reducing the standby power consumption and total operating power consumption of the SSD.

**High reliability and consistency**

This significantly reduces the failure rate and maintenance costs for customers in the later stages, providing a solid foundation for their enterprise-level brand reputation.

**Resistant to switch impact**

Charge and discharge cycles ≥ 200,000.

## Recommended selection (the following are sample specifications for reference only)

| Capacitor type | shape | series | Temperature life | Rated Voltage (Surge Voltage) (V) | Nominal capacity (μF) | Product dimensions ΦD*L (mm) | Tan (120HZ) | ESR (mΩ/100kHz) | Rated ripple current (mA/100kHz) | LC (μA) | Product Part Number |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Liquid aluminum electrolytic capacitors | Lead type | LKF | 105℃ 10000H | 35 (44) | 1800 | 10*30 | 0.12 | 30 | 2900 | 630 | LKFE3001V182VF |
| | | LKF | 105℃ 10000H | 35 (44) | 2200 | 10*30 | 0.14 | 28 | 3200 | 630 | LKFE3001V222VF |
| | | LKF | 105℃ 10000H | 35 (44) | 3300 | 12.5*30 | 0.16 | 27 | 3500 | 945 | LKFL3001V272VF |
| | | LKF | 105℃ 10000H | 35 (44) | 4200 | 12.5*40 | 0.18 | 29 | 4700 | 1470 | LKFL4001V422VF |
| | | LKL | 125℃ 5000H | 35 (44) | 2200 | 10*32 | 0.14 | 60 | 2500 | 630 | LKLE3201V222VF |
| | | LKF | 105℃ 10000H | 35 (44) | 470 | 6.3*23 | 0.12 | 55 | 1150 | 165 | LKFC2301V471MF |
| | | LKF | 105℃ 10000H | 35 (44) | 680 | 8*18 | 0.12 | 28 | 2250 | 238 | LKFD1801V681MF |
| | | LKF | 105℃ 10000H | 35 (44) | 820 | 8*20 | 0.12 | 29 | 2360 | 287 | LKFD2001V821MF |
| | | LKF | 105℃ 10000H | 35 (44) | 1000 | 10*20 | 0.12 | 29 | 2480 | 350 | LKFE2001V102MF |
| | | LKM | 105℃ 10000H | 35 (44) | 1500 | 12.5*20 | 0.12 | 38 | 2960 | 525 | LKML2001V152MF |
| | | LKM | 105℃ 10000H | 35 (44) | 2200 | 12.5*20 | 0.12 | 32 | 3630 | 770 | LKML2501V222MF |

# Data storage disk

## Application Requirements

Ultra-high capacity density; instantaneous power loss protection;
wide temperature range stability & high reliability;

## YMIN Tantalum Capacitor Product Advantages

### Ultra-high capacity density

With extreme volume efficiency, it provides the maximum unit volume capacity in the smallest physical size on the SSD's "every inch is precious" board, freeing up valuable layout space, while meeting the energy requirements for power loss protection.

### Immediate power failure

It can achieve millisecond-level rapid energy release to meet power failure protection requirements, while effectively suppressing surge current during normal power-on, thus perfectly supporting key functions such as hot-swapping and improving the robustness and safety of system applications.

### Wide temperature range stability & high reliability

Some product series can pass the dual 85 test for 1000 hours, and after 20,000 charge-discharge cycles, the capacity decay is still less than 15%. Its excellent long-term high temperature

## Recommended selection (the following are sample specifications for reference only)

| Capacitor type | shape | series | Temperature life | Rated Voltage (Surge Voltage) (V) | Nominal capacity (μF) | Product dimensions (mm) | Tan (120HZ) | ESR (mΩ/100kHz) | Rated ripple current (mA/100kHz) | LC (μA) | Product Part Number |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Conductive polymer Tantalum electrolytic capacitor | surface mount type | TQD15 | 105℃ 2000H | 35 (40.3) | 47 | 7.3*4.3*1.5 | 0.1 | 100 | 1400 | 164.5 | TQD470M1VD15100RN |
| | | TQD19 | 105℃ 2000H | 35 (40.3) | 47 | 7.3*4.3*1.9 | 0.1 | 100 | 1450 | 238 | TQD470M1VD19100RN |
| | | TQD19 | 105℃ 2000H | 35 (40.3) | 68 | 7.3*4.3*1.9 | 0.1 | 100 | 1450 | 238 | TQD680M1VD19100RN |
| | | TQD19 | 105℃ 2000H | 35 (40.3) | 68 | 7.3*4.3*1.9 | 0.1 | 120 | 1200 | 238 | TQD680M1VD19120RN |

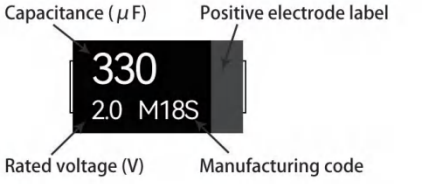
# MPS

- ◆ Ultra-low ESR (3mΩ) and high ripple current
- ◆ 2000-hour warranty at 105℃
- ◆ RoHS compliant (2011/65/EU)


## ■ Main technical parameters

| project | characteristic |
|---|---|
| Operating Temperature Range | －55 ~ +105℃ |
| Rated Operating Voltage | 2 ~ 2.5V |
| Capacity Range | 330 ~ 560μF 120Hz 20℃ |
| Capacity Tolerance | ±20% (120Hz 20℃) |
| Loss Tangent | The following are the values from the standard product list: 120Hz, 20℃ |
| Leakage Current | I≦0.2CV or 200μA (take the maximum value) Charge for 2 minutes at rated voltage, 20℃ |
| Equivalent Series Resistance (ESR) | The following are the values from the standard sample list: 100kHz, 20℃ |
| Surge Voltage (V) | 1.15 times the rated voltage |
| Durability | After being subjected to the rated operating voltage for 2000 hours at 105℃ and placed at 20℃ for 16 hours, the product should meet the following requirements.<br>Capacitance change rate; ±20% of the initial value<br>Loss tangent; ≦ 200% of the initial specification value<br>Leakage current ≦ Initial specification value |
| High Temperature and High Humidity | After being placed at 60℃ and 90%~95% RH for 500 hours without applying voltage, and then placed at 20℃ for 16 hours, the product should meet the following requirements.<br>Capacitance change rate; Initial value +50% -20%<br>Loss tangent; ≦ Initial specification value 200%<br>Leakage current ≦ Initial specification value |

## ■ logo



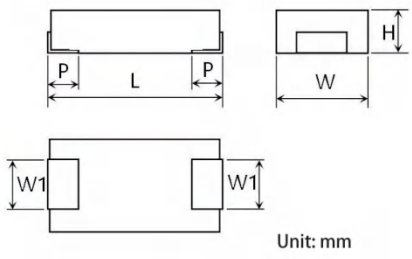

Manufacturing Coding Rules

The first digit represents the manufacturing month.

| Month | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | A | B | C | D | E | F | G | H | J | K | L | M |

The middle two digits represent the year of manufacture, followed by the last two digits.
The last digit is the shell number.

## ■ External dimensions




Unit: mm

| L±0.2 | W±0.2 | H±0.1 | W1±0.1 | P±0.2 |
|---|---|---|---|---|
| 7.3 | 4.3 | 1.9 | 2.4 | 1.3 |

## ■ Temperature coefficient of rated ripple current

| Temperature | T≦45℃ | 45℃<T≦85℃ | 85℃<T≦105℃ |
|---|---|---|---|
| coefficient | 1.0 | 0.7 | 0.25 |

Note: The capacitor surface temperature should not exceed the product's maximum operating temperature.

## ■ Rated ripple current frequency correction factor

| Frequency (Hz) | 120Hz | 1kHz | 10kHz | 100~300kHz |
|---|---|---|---|---|
| Correction Factor | 0.10 | 0.45 | 0.50 | 1.00 |

# MPS

## ■ List of Standard Products

| Rated voltage (V) | Nominal capacity (μF) | Product dimensions (mm) | | | L.C. (μA,2min) | Tan δ 120Hz | ESR (mΩ100kHz) | Rated ripple current (mA/r.m.s) 45℃ 100kHz |
|---|---|---|---|---|---|---|---|---|
| | | L | W | H | | | | |
| 2 | 330 | 7.3 | 4.3 | 1.9 | 200 | 0.06 | 3 | 10200 |
| | 470 | 7.3 | 4.3 | 1.9 | 200 | 0.06 | 3 | 10200 |
| | 560 | 7.3 | 4.3 | 1.9 | 224 | 0.06 | 3 | 10200 |
| 2.5 | 330 | 7.3 | 4.3 | 1.9 | 200 | 0.06 | 3 | 10200 |
| | 390 | 7.3 | 4.3 | 1.9 | 200 | 0.06 | 3 | 10200 |
| | 470 | 7.3 | 4.3 | 1.9 | 235 | 0.06 | 3 | 10200 |

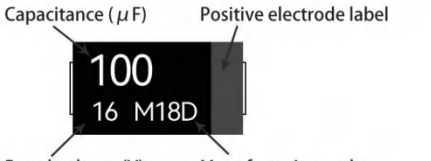
# MPD19

◆Low ESR, high ripple current
◆105℃, 2000-hour warranty
◆High voltage withstand (50V max.)
◆RoHS compliant (2011/65/EU)


## ■ Main technical parameters

| project | characteristic |
|---|---|
| Operating Temperature Range | －55 ~ +105℃ |
| Rated Operating Voltage | 2 ~ 50V |
| Capacity Range | 8.2 ~ 560μF 120Hz 20℃ |
| Capacity Tolerance | ±20% (120Hz 20℃) |
| Loss Tangent | The following are the values from the standard product list: 120Hz, 20℃ |
| Leakage Current | I≦0.1CV Charge for 2 minutes at rated voltage, 20℃ |
| Equivalent Series Resistance (ESR) | The following are the values from the standard sample list: 100kHz, 20℃ |
| Surge Voltage (V) | 1.15 times the rated voltage |
| Durability | After being subjected to the rated operating voltage for 2000 hours at 105℃ and placed at 20℃ for 16 hours, the product should meet the following requirements.<br>Capacitance change rate; ±20% of the initial value<br>Loss tangent; ≦ 200% of the initial specification value<br>Leakage current ≦ Initial specification value |
| High Temperature and High Humidity | After being placed at 60℃ and 90%~95% RH for 500 hours without applying voltage, and then placed at 20℃ for 16 hours, the product should meet the following requirements.<br>Capacitance change rate; Initial value +50% -20%<br>Loss tangent; ≦ Initial specification value 200%<br>Leakage current ≦ Initial specification value |

## ■ logo

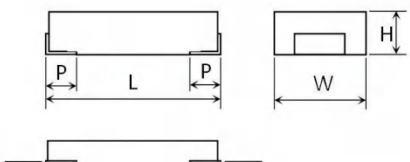



Manufacturing Coding Rules
The first digit represents the manufacturing month.

| Month | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | A | B | C | D | E | F | G | H | J | K | L | M |

The middle two digits represent the year of manufacture, followed by the last two digits.
The last digit is the shell number.

## ■ External dimensions




Unit: mm

| L±0.2 | W±0.2 | H±0.1 | W1±0.1 | P±0.2 |
|---|---|---|---|---|
| 7.3 | 4.3 | 1.9 | 2.4 | 1.3 |

## ■ Temperature coefficient of rated ripple current

| temperature | T≦45℃ | 45℃<T≦85℃ | 85℃<T≦105℃ |
|---|---|---|---|
| 2~10V | 1.0 | 0.7 | 0.25 |
| 16~50V | 1.0 | 0.8 | 0.5 |

Note: The capacitor surface temperature should not exceed the product's maximum operating temperature.

## ■ Rated ripple current frequency correction factor

| Frequency (Hz) | 120Hz | 1kHz | 10kHz | 100~300kHz |
|---|---|---|---|---|
| Correction Factor | 0.10 | 0.45 | 0.50 | 1.00 |

# MPD19

## ■ List of Standard Products

| Rated voltage (V) | Nominal capacity (μF) | Product dimensions (mm) | | | L.C. (μA,2min) | Tan δ 120Hz | ESR (mΩ100kHz) | Rated ripple current (mA/r.m.s) 45℃ 100kHz |
|---|---|---|---|---|---|---|---|---|
| | | L | W | H | | | | |
| 2 | 330 | 7.3 | 4.3 | 1.9 | 66 | 0.06 | 4.5 | 8500 |
| | 390 | 7.3 | 4.3 | 1.9 | 78 | 0.06 | 4.5 | 8500 |
| | 470 | 7.3 | 4.3 | 1.9 | 94 | 0.06 | 4.5 | 8500 |
| | 560 | 7.3 | 4.3 | 1.9 | 112 | 0.06 | 4.5 | 8500 |
| 2.5 | 330 | 7.3 | 4.3 | 1.9 | 83 | 0.06 | 4.5 | 8500 |
| | 390 | 7.3 | 4.3 | 1.9 | 98 | 0.06 | 4.5 | 8500 |
| | 470 | 7.3 | 4.3 | 1.9 | 118 | 0.06 | 4.5 | 8500 |
| | 560 | 7.3 | 4.3 | 1.9 | 140 | 0.06 | 4.5 | 8500 |
| 4 | 150 | 7.3 | 4.3 | 1.9 | 60 | 0.06 | 6 | 7200 |
| | 220 | 7.3 | 4.3 | 1.9 | 88 | 0.06 | 6 | 7200 |
| | 270 | 7.3 | 4.3 | 1.9 | 108 | 0.06 | 6 | 7200 |
| 6.3 | 100 | 7.3 | 4.3 | 1.9 | 63 | 0.06 | 15 | 5100 |
| | 150 | 7.3 | 4.3 | 1.9 | 95 | 0.06 | 9 | 6300 |
| | 220 | 7.3 | 4.3 | 1.9 | 139 | 0.06 | 9 | 6300 |
| 10 | 100 | 7.3 | 4.3 | 1.9 | 100 | 0.06 | 10 | 6500 |
| | 150 | 7.3 | 4.3 | 1.9 | 150 | 0.06 | 10 | 6500 |
| 16 | 33 | 7.3 | 4.3 | 1.9 | 53 | 0.06 | 50 | 2850 |
| | 47 | 7.3 | 4.3 | 1.9 | 75 | 0.06 | 45 | 3000 |
| | 68 | 7.3 | 4.3 | 1.9 | 109 | 0.06 | 40 | 3200 |
| | 100 | 7.3 | 4.3 | 1.9 | 160 | 0.06 | 40 | 3200 |
| 20 | 10 | 7.3 | 4.3 | 1.9 | 20 | 0.06 | 80 | 2200 |
| | 22 | 7.3 | 4.3 | 1.9 | 44 | 0.06 | 65 | 2500 |
| | 33 | 7.3 | 4.3 | 1.9 | 66 | 0.06 | 45 | 3000 |
| | 47 | 7.3 | 4.3 | 1.9 | 94 | 0.06 | 40 | 3200 |
| | 68 | 7.3 | 4.3 | 1.9 | 136 | 0.06 | 40 | 3200 |
| 25 | 10 | 7.3 | 4.3 | 1.9 | 25 | 0.06 | 80 | 2200 |
| | 22 | 7.3 | 4.3 | 1.9 | 55 | 0.06 | 65 | 2500 |
| | 33 | 7.3 | 4.3 | 1.9 | 83 | 0.06 | 45 | 3000 |
| | 39 | 7.3 | 4.3 | 1.9 | 98 | 0.06 | 40 | 3200 |
| | 47 | 7.3 | 4.3 | 1.9 | 118 | 0.06 | 40 | 3200 |
| | 68 | 7.3 | 4.3 | 1.9 | 170 | 0.06 | 40 | 3200 |
| 35 | 15 | 7.3 | 4.3 | 1.9 | 53 | 0.06 | 50 | 2850 |
| | 22 | 7.3 | 4.3 | 1.9 | 77 | 0.06 | 40 | 3200 |
| 50 | 8.2 | 7.3 | 4.3 | 1.9 | 41 | 0.06 | 55 | 2700 |
| | 10 | 7.3 | 4.3 | 1.9 | 50 | 0.06 | 45 | 3000 |