

## 12V, 15V and 24V 20A Buffer (Hold-Up) Modules

<https://product.tdk.com/en/power/zbm>  
[www.emea.lambda.tdk.com/zbm](http://www.emea.lambda.tdk.com/zbm)



Industrial



Test



Semi-Fab



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Broadcast



The ZBM20 20A buffer modules are ideal for providing short term hold-up or peak power for loads powered by 12V, 15V or 24Vdc output AC-DC power supplies. During normal operation, energy is stored in the ZBM20's electrolytic capacitors. When the AC power is interrupted for a short period of time, the ZBM20 continues to power the load, allowing equipment to shutdown in a safe and controlled manner. The ZBM20 can be set to fixed or variable buffer mode. In fixed mode it will provide power when the input voltage drops to below a preset level, in variable mode (24V model only) when the input decreases by 1V. Multiple buffer modules can be paralleled for additional hold-up time. Product status can be accessed remotely via a DC OK relay. The output voltage can also be inhibited to avoid an unsafe discharge of the stored energy.

| Features                                                     | Benefits                                            |
|--------------------------------------------------------------|-----------------------------------------------------|
| • Provides 380ms Additional Hold-Up Time at Max Buffer Power | • Avoids Loss of Data During AC Power Interruptions |
| • Utilizes Electrolytic Capacitors to Store Energy           | • No Batteries to Service or Maintain               |
| • Five Year Warranty                                         | • Lower Cost of Ownership                           |
| • Parallel Capable                                           | • Hold-Up Time Can Be Extended                      |
| • Output Remote On/Off Function                              | • Avoids Unsafe Discharge of Stored Energy          |

| Model Selector |                                         |                                           |                           |                                |
|----------------|-----------------------------------------|-------------------------------------------|---------------------------|--------------------------------|
| Model          | Output Voltage<br>Fixed Mode<br>(V) (1) | Output Voltage<br>Dynamic Mode<br>(V) (1) | Maximum<br>Current<br>(A) | Average<br>Buffer Power<br>(W) |
| ZBM20-12       | 11                                      | -                                         | 20                        | 220                            |
| ZBM20-15       | 13.8                                    | -                                         | 20                        | 276                            |
| ZBM20-24       | 22.4                                    | Vin-1                                     | 20                        | 448                            |

| Specifications                         |             |                                                                              |           |                                                  |
|----------------------------------------|-------------|------------------------------------------------------------------------------|-----------|--------------------------------------------------|
| Model                                  |             | ZBM20-12                                                                     | ZBM20-15  | ZBM20-24                                         |
| Input                                  |             |                                                                              |           |                                                  |
| Input Voltage range                    | Vdc         | 11.5 - 14.4                                                                  | 14.4 - 18 | Fixed Mode: 23 - 30<br>Vin-1 Mode: 24 - 30       |
| Input Current (Typical)                | A           | Charging Mode: 0.8, Ready Mode: 0.2                                          |           |                                                  |
| Charging Time (Typical)                | s           | 40                                                                           |           |                                                  |
| Hold Up Time (Typical)                 | ms          | 380                                                                          |           |                                                  |
| Conducted & Radiated EMI               | -           | EN55032-B CISPR32-B                                                          |           |                                                  |
| Immunity                               | -           | See immunity table                                                           |           |                                                  |
| Safety Agency Certifications           | -           | IEC/UL/CSA/EN62368-1, CE Mark (LVD, EMC and RoHS)                            |           |                                                  |
| Immunity                               |             |                                                                              |           |                                                  |
| Test                                   | Standard    | Test Level                                                                   | Criteria  | Notes                                            |
| ESD                                    | EN61000-4-2 | 4                                                                            | A         | 15kV air, 8kV contact                            |
| Radiated Susceptibility                | EN61000-4-3 | 3                                                                            | A         |                                                  |
| Electrical Fast Transient Burst        | EN61000-4-4 | 1-3                                                                          | A         | Signal pin to FG Lvl 1                           |
| Surge                                  | EN61000-4-5 | 1-2                                                                          | A         | Common mode only Lvl 2<br>Signal pin to FG Lvl 1 |
| Conducted Susceptibility               | EN61000-4-6 | 3                                                                            | A         | -                                                |
| Output                                 |             |                                                                              |           |                                                  |
| Buffer Voltage Tolerance (Load > 5%)   | %           | Fixed Mode: ±2, Dynamic Mode: +3 to -4 (24V model only)                      |           |                                                  |
| Switching Frequency (Typical)          | kHz         | Buck Converter: 100, Boost Converter: 65                                     |           |                                                  |
| Ripple & Noise                         | mV          | <160                                                                         |           | <240                                             |
| Minimum Load                           | -           | No minimum load required                                                     |           |                                                  |
| Overcurrent Protection                 | %           | >105 of buffer current                                                       |           |                                                  |
| Input Overvoltage Protection           | -           | Yes                                                                          |           |                                                  |
| Overtemperature Protection             | -           | No                                                                           |           |                                                  |
| Remote On/Off                          | -           | Yes                                                                          |           |                                                  |
| DC OK Relay                            | -           | Photo MOS relay closed when DC is okay. (30V 0.2A)                           |           |                                                  |
| Status Signals                         | -           | Photocoupled signals indicating fully charged and discharging modes          |           |                                                  |
| Indicators                             | -           | Green LED is off when bulk capacitor voltage is below SELV level             |           |                                                  |
| Parallel Operation                     | -           | Possible, see installation manual                                            |           |                                                  |
| Series Operation                       | -           | Not possible                                                                 |           |                                                  |
| Environmental                          |             |                                                                              |           |                                                  |
| Operating Temperature                  | °C          | -25 to +70                                                                   |           |                                                  |
| Storage Temperature                    | °C          | -25 to +85                                                                   |           |                                                  |
| Humidity (non condensing)              | %RH         | Operating: 30 - 90, storage: 10 - 90                                         |           |                                                  |
| Cooling                                | -           | Convection                                                                   |           |                                                  |
| Altitude                               | m           | 5,000                                                                        |           |                                                  |
| Withstand Voltage (For 1 minute)       | Vac         | Input and output to ground 500                                               |           |                                                  |
| Isolation Resistance                   | MΩ          | >100 at 25°C, 70%RH & 500VDC (input and output to ground)                    |           |                                                  |
| Vibration (Non Operating)              | -           | 10 - 55Hz (sweep for 1 min) 19.6m/s² (constant X, Y, Z axis for 1 hour each) |           |                                                  |
| Shock (In packaging)                   | m/s²        | < 196.1                                                                      |           |                                                  |
| Other                                  |             |                                                                              |           |                                                  |
| Weight (Typ)                           | g           | 550                                                                          |           |                                                  |
| Size (LxWxH)                           | mm          | 175 x 85 x 57                                                                |           |                                                  |
| Size (LxWxH)                           | Inches      | 6.89 x 3.35 x 2.24                                                           |           |                                                  |
| Connectors                             |             | CN1 & 2: JST B6P-VH, CN3: JST B6B-XH-A                                       |           |                                                  |
| MTBF - Telcordia TR-332 issue 5 (25°C) | Hours       | 1,960,742                                                                    |           |                                                  |
| Warranty                               | yrs         | 5                                                                            |           |                                                  |

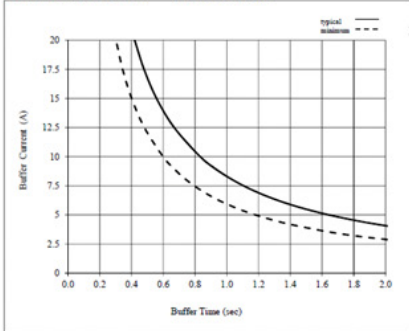
## Notes

See website for detailed specifications, test methods and installation manual

(1) ZBM20-24 Fixed and VIN-1 mode is switch selectable using SW1

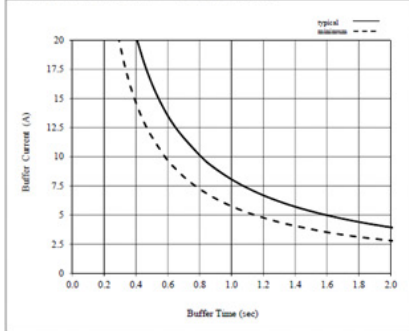
## Buffer Time Versus Buffer Current

ZBM20-12 :  
Buffer time : 0 – 2 seconds



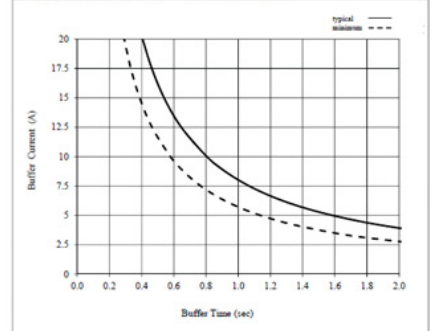
NOTE : Ta=25°C and initial capacitance.

ZBM20-15 :  
Buffer time : 0 – 2 seconds



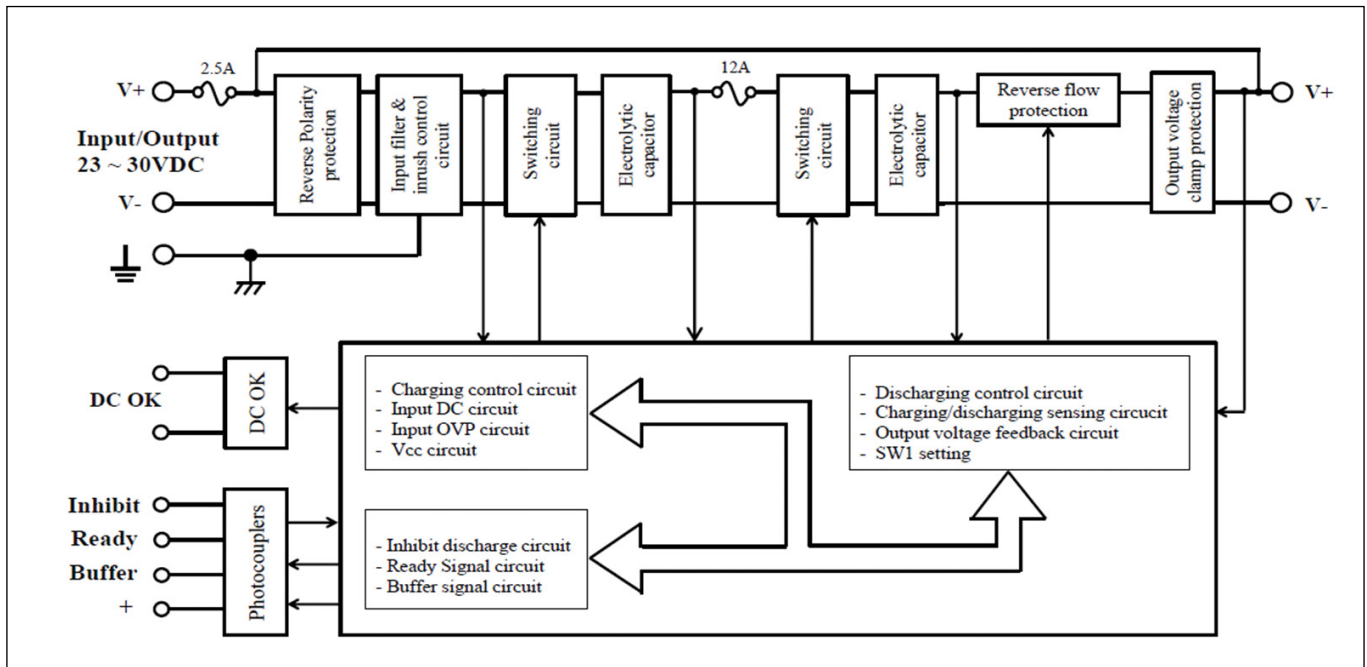
NOTE : Ta=25°C and initial capacitance.

ZBM20-24 :  
Buffer time : 0 – 2 seconds

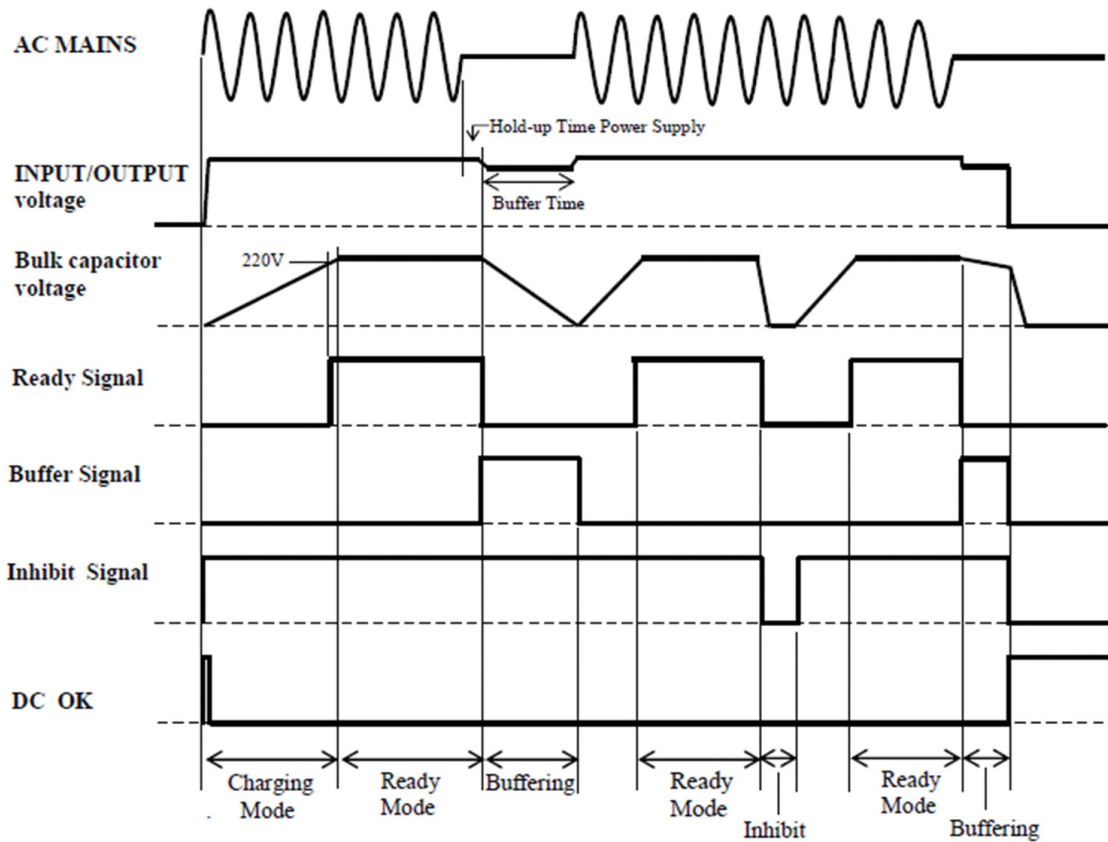


NOTE : Ta=25°C and initial capacitance.

## Block Diagram

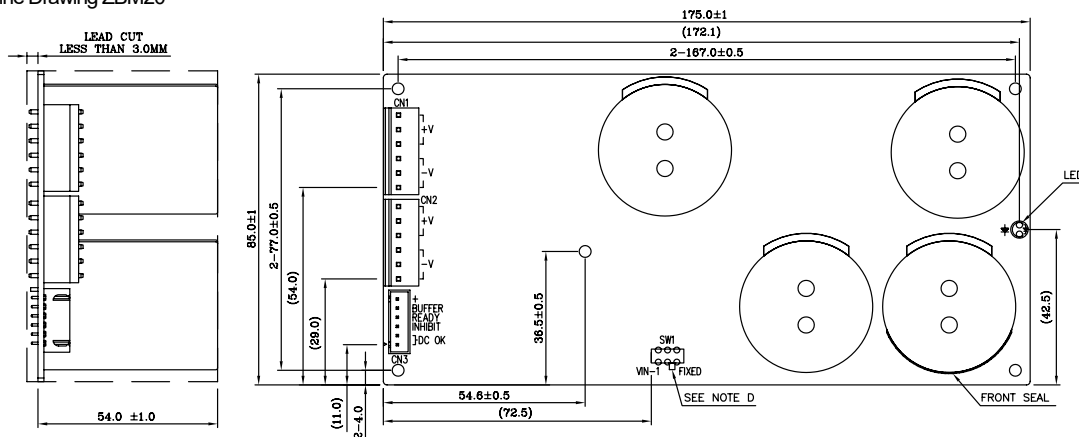


## Timing Diagram



## Mechanical Specification

### Outline Drawing ZBM20

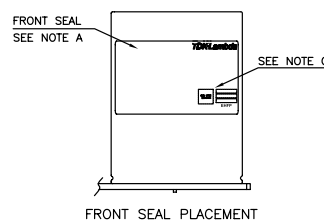


#### CONNECTORS USED :

| PART DESCRIPTION       | PART NAME        | MANUFACT. | QTY |
|------------------------|------------------|-----------|-----|
| PIN HEADER (CN1 & CN2) | B6P-VH(LF)(SN)   | J.S.T.    | 2   |
| PIN HEADER (CN3)       | B6B-XH-A(LF)(SN) | J.S.T.    | 1   |

#### MATCHING HOUSINGS, PINS & TOOL (NOT INCLUDED WITH THE PRODUCT):

| PART DESCRIPTION           | PART NAME     | MANUFACT. | QTY |
|----------------------------|---------------|-----------|-----|
| SOCKET HOUSING (CN1 & CN2) | VHR-6N        | J.S.T.    | 2   |
| SOCKET HOUSING (CN3)       | XHP-6         | J.S.T.    | 1   |
| TERMINAL PINS              | SVH-41T-P1.1  | J.S.T.    | 12  |
| TERMINAL PINS              | SXH-002T-P0.6 | J.S.T.    | 6   |



#### NOTES

- MODEL NAME, INPUT VOLTAGE RANGE, NOMINAL OUTPUT VOLTAGE, MAXIMUM OUTPUT CURRENT, BUFFER TIME & COUNTRY OF MANUFACTURE ARE SHOWN IN ACCORDANCE WITH THE SPECIFICATION.
- 5- $\phi$ 3.2 HOLES ARE FOR CUSTOMER'S CHASSIS MOUNTING HOLE.
- BARCODE, SERIAL NO. ARE SHOWN HERE.
- SWITCH IS SELECTED TO FIXED MODE BEFORE SHIPMENT. (SWITCH IS FOR 24V ONLY).



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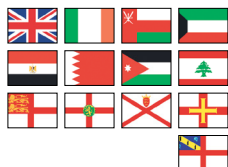
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