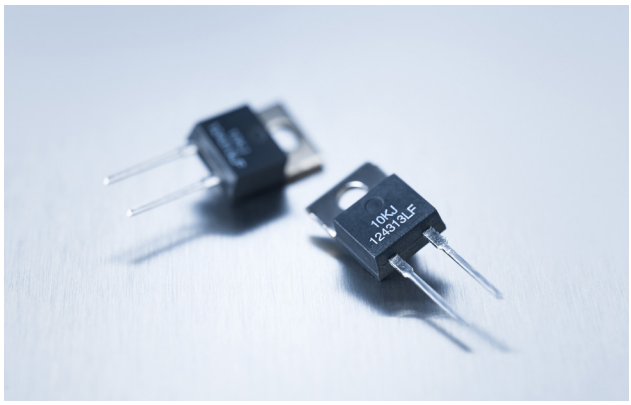
# Series MXP 35 TO-220

35 W Thick Film Resistor for high-frequency and pulse-loading applications



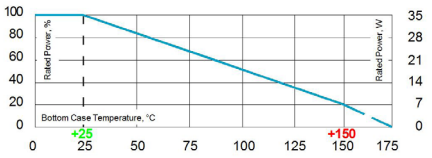
## Features

- 35 W operating power
- **TO-220 package** configuration
- Single-screw mounting simplifies attachment to heat sink
- Molded case for environmental protection
- Resistor element is electrically insulated from the metal sink tab
- Standard lead form for easier fit
- Non-Inductive design
- ROHS compliant
- Materials in accordance with UL 94 V-0




## Technical Specifications

| | |
|---|---|
| **Resistance value** | 0.05 Ω to 1 MΩ (other values on special request) |
| **Resistance tolerance** | ±1 % to ± 10 %<br>±0.5 % on special request for limited ohmic values |
| **Temperature coefficient** | < 3 Ω: ask for details<br>≥ 3 Ω < 10 Ω: ±100 ppm + 0.002 Ω/°C<br>≥ 10 Ω: ±50 ppm/°C<br>(referenced to 25 °C, ΔR taken at +85°C) |
| **Power rating** | 35 W at 25°C bottom case temperature |
| **Maximum operating voltage** | 350 V |
| **Dielectric strength voltage** | 1800 V AC |
| **Insulation resistance** | > 10 GΩ at 1000 V DC |
| **Momentary overload** | 2x rated power with applied voltage not to exceed 1.5x maximum continuous operating voltage for 5 s. ΔR ±(0.3 % + 0.01 Ω) max. |
| **Load life** | MIL-R-39009, 2000 h at rated power, ΔR ± (1.0 % + 0.01 Ω) max. |
| **Moisture resistance** | MIL-STD-202, method 106<br>ΔR = (0.5 % + 0.01 Ω) max. |
| **Thermal shock** | MIL-STD-202, method 107, Cond. F,<br>ΔR = (0.3 % + 0.01 Ω) max. |
| **Working temperature range** | -55 °C to +175 °C |
| **Terminal strength** | MIL-STD-202, method 211, Cond. A (Pull Test) 2.4 N, ΔR = (0.2 % + 0.01 Ω) max. |
| **Vibration, high frequency** | MIL-STD-202, method 204, Cond. D,<br>ΔR = (0.2 % + 0.01 Ω) max. |
| **Lead material** | tinned copper |
| **Torque** | 0.7 Nm to 0.9 Nm |
| **Heat resistance to cooling plate** | Rth < 4.28 K/W |
| **Weight** | ~2 g |




Derating (thermal resist.) MXP-35:
0.23 W/K (4.28 K/W)

Without a heat sink, when in open air at 25°C, the MXP-35 is rated for 2.50 W. Derating for temperature above 25°C is 0.02 W/K.

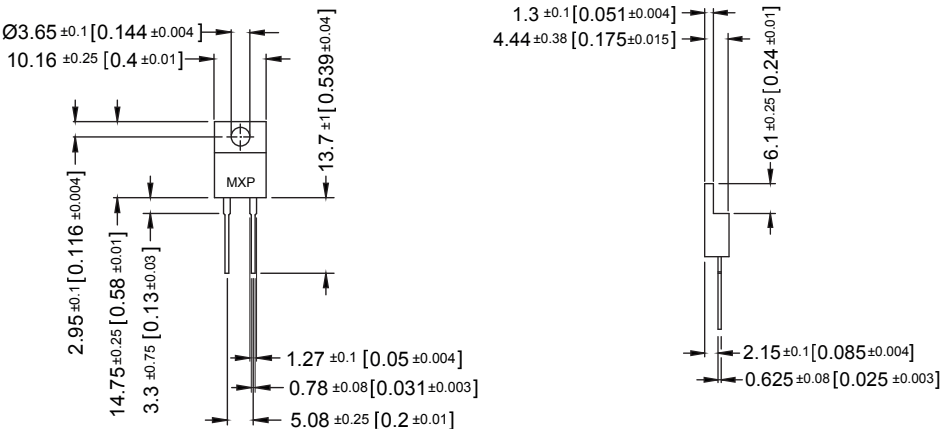
Case temperature must be used for definition of the applied power limit. Case temperature measurement must be done with a thermocouple contacting the center of the component mounted on the designed heat sink. Thermal grease should be applied properly.

## How to make a request

**MXP_Ohmic Value_Tolerance**

**For example:**
MXP 20R 10%

## Dimensions in mm [inches]




The above spec. sheet features our standard products. For further options please contact your local Miba Resistors representative.

# Series MXP 35 TO-220



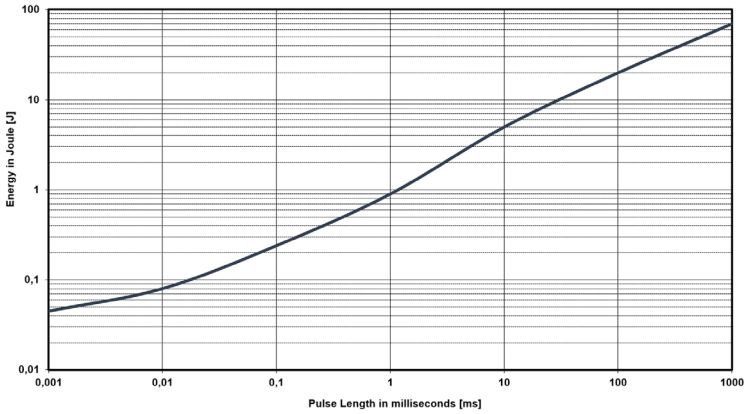
## Pulse Energy Curve (typical rating for MXP 35)

Note:These energy values are reference values → depending on ohmic value e.g. 1 Ω to 10 Ω and used resistive paste, a variation in max. energy load capability is possible

### Test procedure

Every test resistor was mounted with thermal compound (0.9 W/mK) on a water cooled heatsink

- Constant inlet water temperature: +50°C
- The test time of each tested resistor: 10min.
- Break time between two pulses: 1s.
- To determine good / defect parts the ohmic value was measured before and after tests: a change of tolerance of more than 0.1% means defect




**Description of Pulse Energy Curve**

- Shape of pulse = e-function
- Time between two pulses = 1 second
- Pulse length = time constant of 1 tau (1 means ... tau = 1ms)

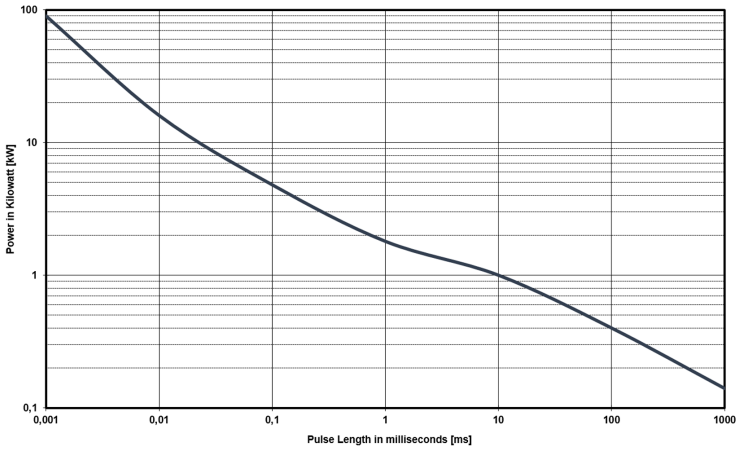
**Example**

At 1 ms tau the MXP 35 with e.g. 1 Ω to 10 Ω can withstand an energy level of about 0.9 J, when the pulse pause time is ≥ 1s

**At a symmetrical frequency > 1 kHz at pulse length ≥ 10 µs. the maximum applied pulse energy for MXP 35 is a result out of the nominal power 35 W divided by the operating frequency (at 25°C bottom case) (E = 35 W / F)**

## Pulse Power Curve (typical rating for MXP 35)

The power curve shows the max. possible power which can be applied for a certain duration.
Referring to the same test procedure as described above.




**Description of Pulse Power Curve**

- Shape of pulse = e-function
- Time between two pulses = 1 second
- Pulse length = time constant of 1 tau (1 means ... tau = 1ms)

**Example**

For the time-constant of 1 ms you can apply about 1.8 kW max. (Pp = 2*E / T)→, if the time between two such peaks is ≥ 1s

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