



Standard Rectifier

$V_{RRM} = 2 \times 1600 \text{ V}$

$I_{FAV} = 10 \text{ A}$

$V_F = 1.18 \text{ V}$

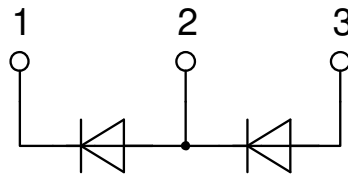
Phase leg

Part number

DMA10P1600HR



Backside: isolated



Features / Advantages:

- Planar passivated chips
- Very low leakage current
- Very low forward voltage drop
- Improved thermal behaviour

Applications:

- Diode for main rectification
- For single and three phase bridge configurations

Package: ISO247

- Isolation Voltage: 3600 V~
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Soldering pins for PCB mounting
- Backside: DCB ceramic
- Reduced weight
- Advanced power cycling

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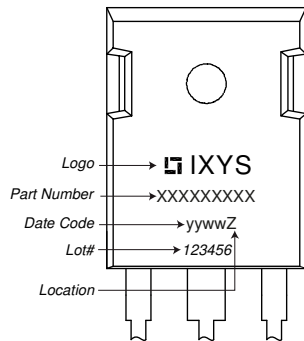


| Rectifier | | | | Ratings | | | |
|------------|--|--|------------------------------|---------|------|------------|------------------|
| Symbol | Definition | Conditions | min. | typ. | max. | Unit | |
| V_{RSM} | max. non-repetitive reverse blocking voltage | | | | 1700 | V | |
| V_{RRM} | max. repetitive reverse blocking voltage | | | | 1600 | V | |
| I_R | reverse current | $V_R = 1600$ V | | | 10 | μ A | |
| | | $V_R = 1600$ V | | | 0.2 | mA | |
| V_F | forward voltage drop | $I_F = 10$ A | | | 1.23 | V | |
| | | $I_F = 20$ A | | | 1.46 | V | |
| | | $I_F = 10$ A | $T_{VJ} = 150^\circ\text{C}$ | | | 1.18 | V |
| | | $I_F = 20$ A | $T_{VJ} = 150^\circ\text{C}$ | | | 1.49 | V |
| I_{FAV} | average forward current | $T_C = 145^\circ\text{C}$ rectangular | | | 10 | A | |
| V_{FO} | threshold voltage | } for power loss calculation only | | | 0.81 | V | |
| r_F | slope resistance | | | | 34 | m Ω | |
| R_{thJC} | thermal resistance junction to case | | | | 2 | K/W | |
| R_{thCH} | thermal resistance case to heatsink | | | 0.3 | | K/W | |
| P_{tot} | total power dissipation | | | | 75 | W | |
| I_{FSM} | max. forward surge current | $t = 10$ ms; (50 Hz), sine | $T_{VJ} = 45^\circ\text{C}$ | | | 120 | A |
| | | $t = 8,3$ ms; (60 Hz), sine | $V_R = 0$ V | | | 130 | A |
| | | $t = 10$ ms; (50 Hz), sine | $T_{VJ} = 150^\circ\text{C}$ | | | 100 | A |
| | | $t = 8,3$ ms; (60 Hz), sine | $V_R = 0$ V | | | 110 | A |
| I^2t | value for fusing | $t = 10$ ms; (50 Hz), sine | $T_{VJ} = 45^\circ\text{C}$ | | | 72 | A ² s |
| | | $t = 8,3$ ms; (60 Hz), sine | $V_R = 0$ V | | | 70 | A ² s |
| | | $t = 10$ ms; (50 Hz), sine | $T_{VJ} = 150^\circ\text{C}$ | | | 50 | A ² s |
| | | $t = 8,3$ ms; (60 Hz), sine | $V_R = 0$ V | | | 50 | A ² s |
| C_J | junction capacitance | $V_R = 400$ V; $f = 1$ MHz | $T_{VJ} = 25^\circ\text{C}$ | | 4 | pF | |



| Package ISO247 | | Ratings | | | | |
|----------------|--|----------------------|------|------|------|------|
| Symbol | Definition | Conditions | min. | typ. | max. | Unit |
| I_{RMS} | RMS current | per terminal | | | 70 | A |
| T_{VJ} | virtual junction temperature | | -55 | | 175 | °C |
| T_{op} | operation temperature | | -55 | | 150 | °C |
| T_{stg} | storage temperature | | -55 | | 150 | °C |
| Weight | | | | 6 | | g |
| M_D | mounting torque | | 0.8 | | 1.2 | Nm |
| F_C | mounting force with clip | | 20 | | 120 | N |
| $d_{Spp/App}$ | creepage distance on surface striking distance through air | terminal to terminal | 2.7 | | | mm |
| $d_{Spb/Apb}$ | | terminal to backside | 4.1 | | | mm |
| V_{ISOL} | isolation voltage | t = 1 second | 3600 | | | V |
| | | t = 1 minute | 3000 | | | V |

Product Marking



Part description

- D = Diode
- M = Standard Rectifier
- A = (up to 1800V)
- 10 = Current Rating [A]
- P = Phase leg
- 1600 = Reverse Voltage [V]
- HR = ISO247 (3)

| Ordering | Ordering Number | Marking on Product | Delivery Mode | Quantity | Code No. |
|----------|-----------------|--------------------|---------------|----------|----------|
| Standard | DMA10P1600HR | DMA10P1600HR | Tube | 30 | 522535 |

| Similar Part | Package | Voltage class |
|--------------|------------|---------------|
| DMA10P1200HR | ISO247 (3) | 1200 |

Equivalent Circuits for Simulation

* on die level

$T_{VJ} = 175^{\circ}C$



Rectifier

| | | | |
|--------------|--------------------|------|----|
| $V_{0\ max}$ | threshold voltage | 0.81 | V |
| $R_{0\ max}$ | slope resistance * | 31 | mΩ |



Outlines ISO247



| Dim. | Millimeter | | Inches | |
|------|------------|-------|------------|-------|
| | min | max | min | max |
| A | 4.70 | 5.30 | 0.185 | 0.209 |
| A1 | 2.21 | 2.59 | 0.087 | 0.102 |
| A2 | 1.50 | 2.49 | 0.059 | 0.098 |
| A3 | typ. 0.05 | | typ. 0.002 | |
| b | 0.99 | 1.40 | 0.039 | 0.055 |
| b2 | 1.65 | 2.39 | 0.065 | 0.094 |
| b4 | 2.59 | 3.43 | 0.102 | 0.135 |
| c | 0.38 | 0.89 | 0.015 | 0.035 |
| D | 20.79 | 21.45 | 0.819 | 0.844 |
| D1 | typ. 8.90 | | typ. 0.350 | |
| D2 | typ. 2.90 | | typ. 0.114 | |
| D3 | typ. 1.00 | | typ. 0.039 | |
| E | 15.49 | 16.24 | 0.610 | 0.639 |
| E1 | typ. 13.45 | | typ. 0.530 | |
| E2 | 4.31 | 5.48 | 0.170 | 0.216 |
| E3 | typ. 4.00 | | typ. 0.157 | |
| e | 5.46 BSC | | 0.215 BSC | |
| L | 19.80 | 20.30 | 0.780 | 0.799 |
| L1 | - | 4.49 | - | 0.177 |
| Ø P | 3.55 | 3.65 | 0.140 | 0.144 |
| Q | 5.38 | 6.19 | 0.212 | 0.244 |
| S | 6.14 BSC | | 0.242 BSC | |



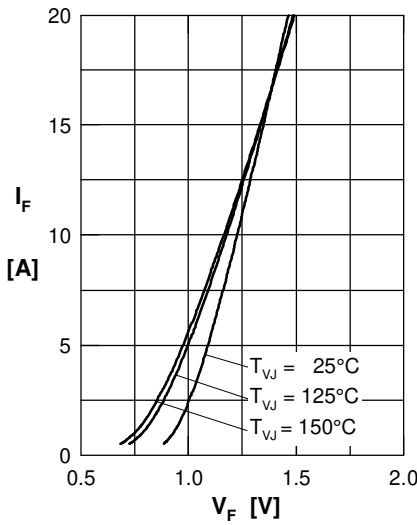
Rectifier


Fig. 1 Forward current versus voltage drop per diode

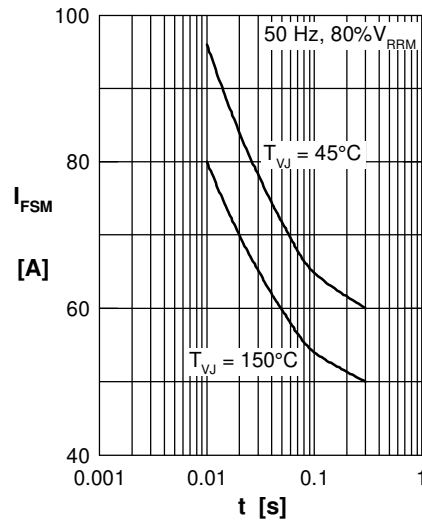


Fig. 2 Surge overload current

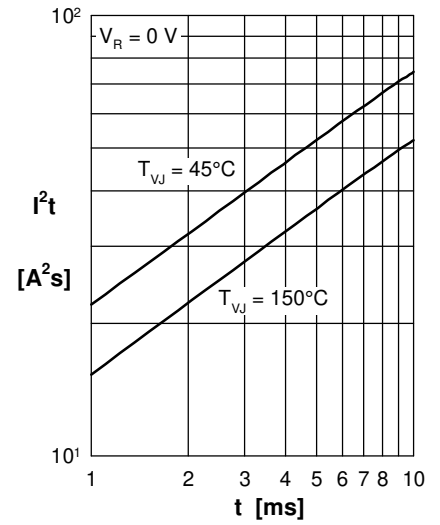
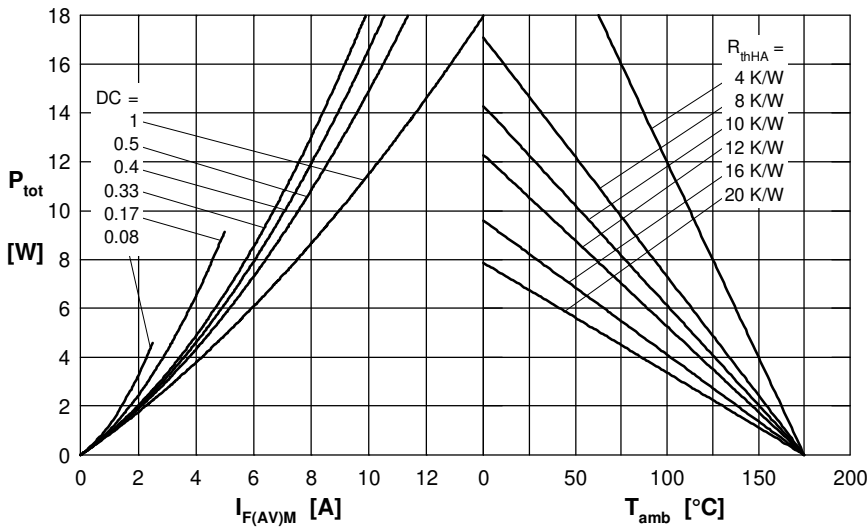

 Fig. 3 I^2t versus time per diode


Fig. 4 Power dissipation vs. direct output current and ambient temperature

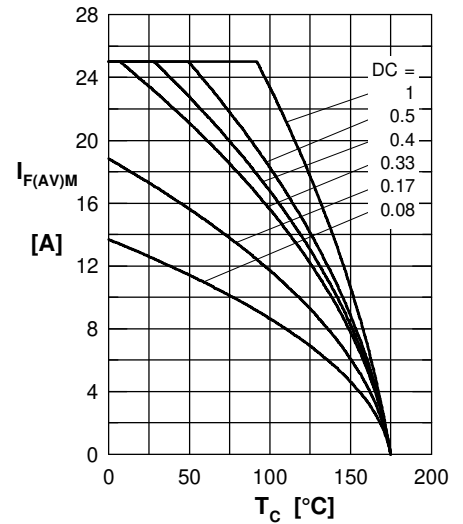


Fig. 5 Max. forward current vs. case temperature

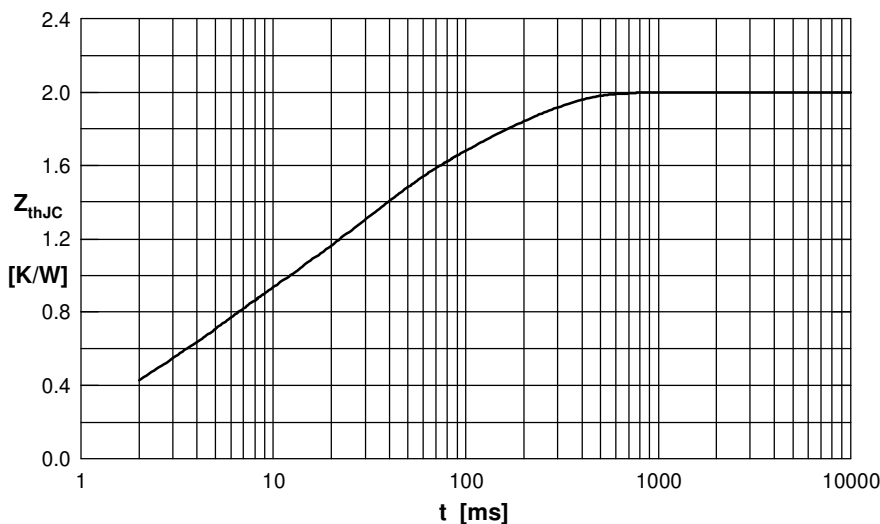


Fig. 6 Transient thermal impedance junction to case

 Constants for Z_{thJC} calculation:

| i | R_{thi} (K/W) | t_i (s) |
|---|-----------------|-----------|
| 1 | 0.06 | 0.0004 |
| 2 | 0.23 | 0.0020 |
| 3 | 0.40 | 0.0040 |
| 4 | 0.71 | 0.0240 |
| 5 | 0.60 | 0.1500 |