

**BYW29/F/FP/G-200****THERMAL RESISTANCE**

| Symbol    | Parameter                           |                   | Value | Unit |
|-----------|-------------------------------------|-------------------|-------|------|
| Rth (j-c) | Junction to case thermal resistance | TO-220AC<br>D2PAK | 2.8   | °C/W |
|           |                                     | ISOWATT220AC      | 5     |      |
|           |                                     | TO-220FPAC        | 5.5   |      |

**STATIC ELECTRICAL CHARACTERISTICS**

| Symbol            | Parameter               | Test Conditions                   |                        | Min. | Typ. | Max. | Unit |
|-------------------|-------------------------|-----------------------------------|------------------------|------|------|------|------|
| I <sub>R</sub> *  | Reverse leakage current | V <sub>R</sub> = V <sub>RRM</sub> | T <sub>j</sub> = 25°C  |      |      | 10   | μA   |
|                   |                         |                                   | T <sub>j</sub> = 100°C |      |      | 0.6  | mA   |
| V <sub>F</sub> ** | Forward voltage drop    | I <sub>F</sub> = 5 A              | T <sub>j</sub> = 125°C |      |      | 0.85 | V    |
|                   |                         | I <sub>F</sub> = 10 A             | T <sub>j</sub> = 125°C |      |      | 1.05 |      |
|                   |                         | I <sub>F</sub> = 10 A             | T <sub>j</sub> = 25°C  |      |      | 1.15 |      |

Pulse test : \* tp = 5 ms, duty cycle < 2 %

\*\* tp = 380 μs, duty cycle < 2 %

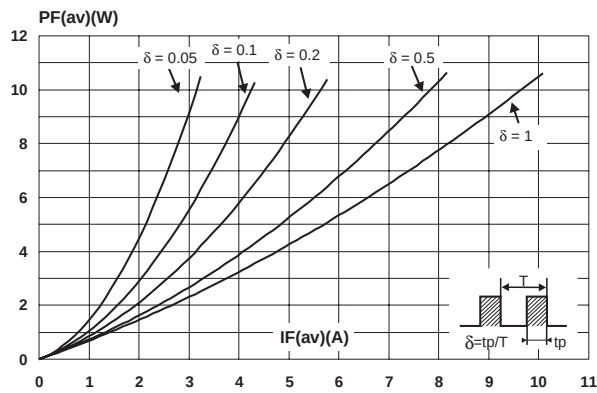
To evaluate the conduction losses use the following equation :

$$P = 0.65 \times I_{F(AV)} + 0.040 I_F^2 (RMS)$$

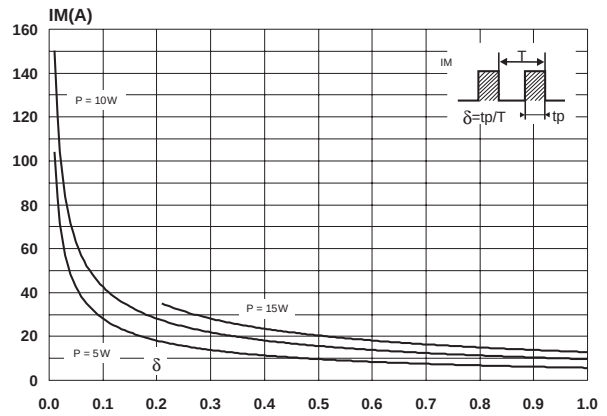
**RECOVERY CHARACTERISTICS**

| Symbol          | Parameter             | Test Conditions               |                       | Min. | Typ. | Max. | Unit |
|-----------------|-----------------------|-------------------------------|-----------------------|------|------|------|------|
| t <sub>rr</sub> | Reverse recovery time | T <sub>j</sub> = 25°C         | I <sub>F</sub> = 0.5A |      |      | 25   | ns   |
|                 |                       | I <sub>rr</sub> = 0.25 A      | I <sub>R</sub> = 1A   |      |      | 35   |      |
| t <sub>fr</sub> | Forward recovery time | T <sub>j</sub> = 25°C         | I <sub>F</sub> = 1A   |      |      |      | ns   |
|                 |                       | di <sub>F</sub> /dt = 100A/μs | V <sub>R</sub> = 30V  |      | 15   |      |      |
| V <sub>FP</sub> | Peak forward voltage  | T <sub>j</sub> = 25°C         | I <sub>F</sub> = 1A   |      |      |      | V    |
|                 |                       | di <sub>F</sub> /dt = 100A/μs |                       |      | 2    |      |      |

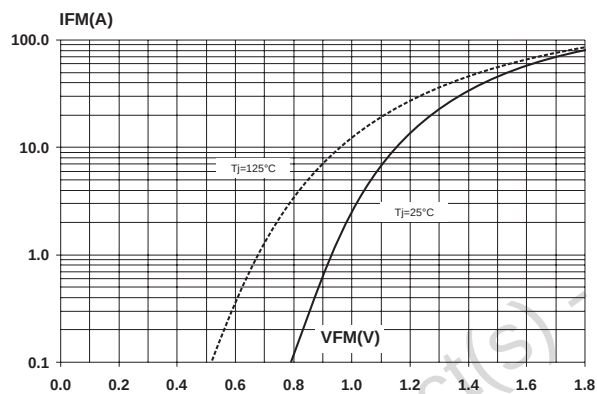
**Fig.1 :** Average forward power dissipation versus average forward current.



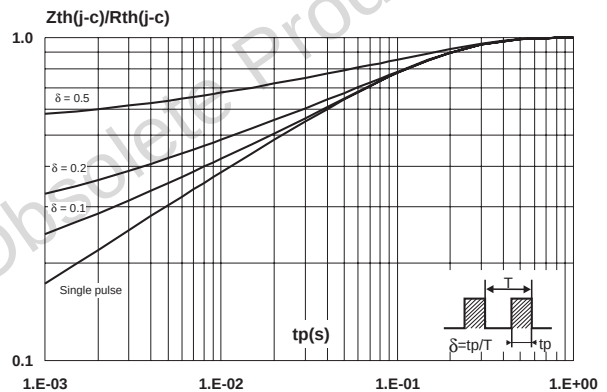
**Fig.2 :** Peak current versus form factor.



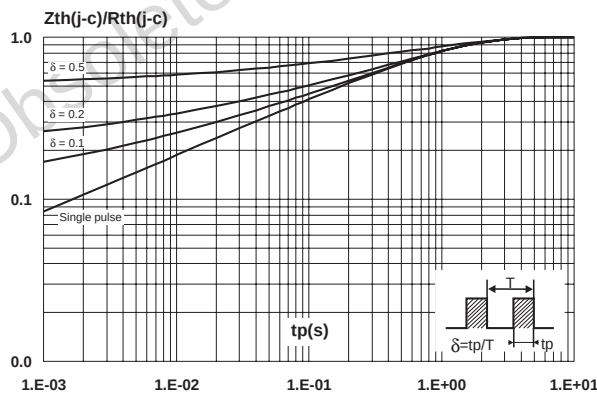
**Fig.3 :** Forward voltage drop versus forward current (maximum values).



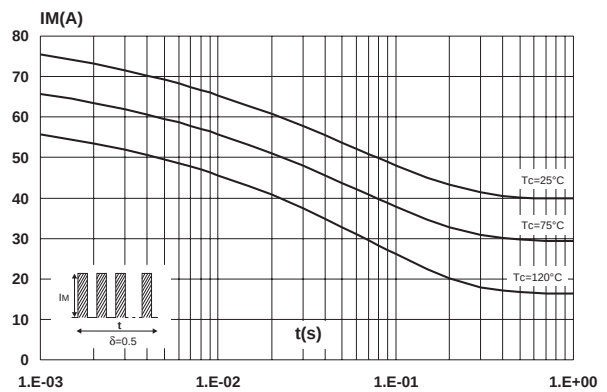
**Fig.4-1 :** Relative variation of thermal impedance junction to case versus pulse duration (TO-220AC, D<sup>2</sup>PAK).



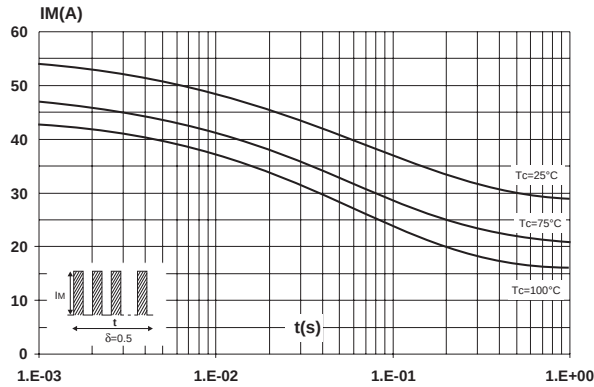
**Fig.4-2 :** Relative variation of thermal impedance junction to case versus pulse duration (TO-220FPAC, ISOWATT220AC).



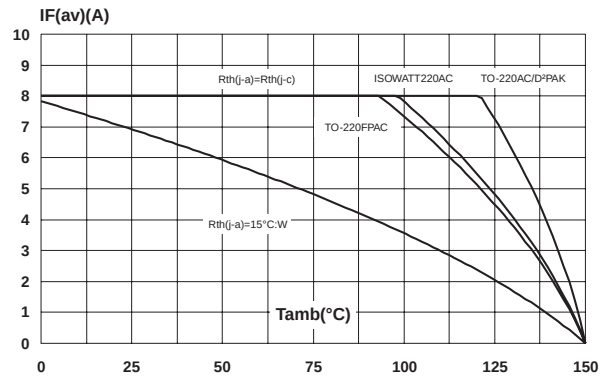
**Fig.5-1 :** Non repetitive surge peak forward current versus overload duration (TO-220AC, D<sup>2</sup>PAK).



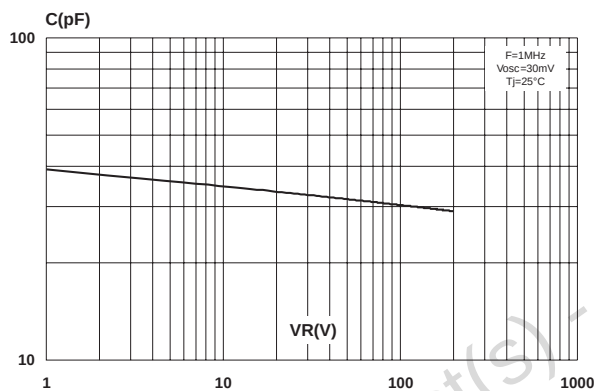
**Fig.5-2** : Non repetitive surge peak forward current versus overload duration (TO-220FPAC, ISOWATT220AC).



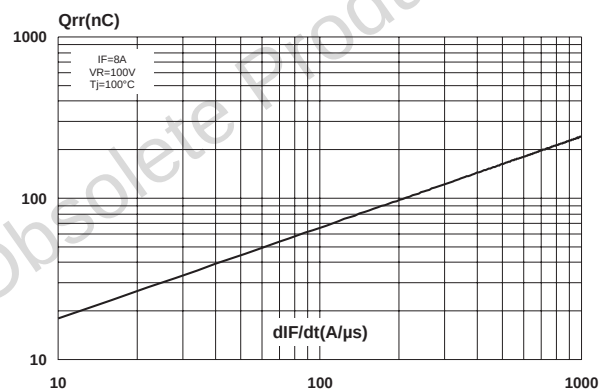
**Fig.6** : Average current versus ambient temperature. ( $\delta = 0.5$ )



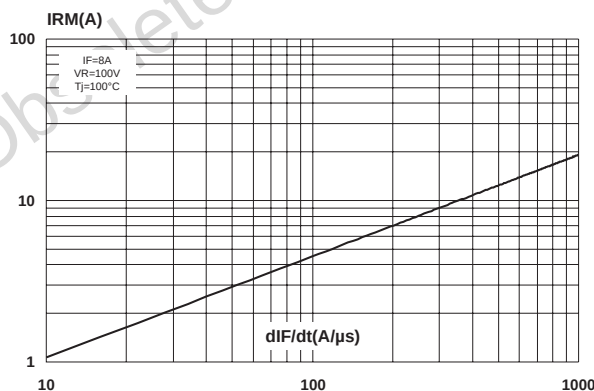
**Fig.7** : Junction capacitance versus reverse voltage applied (Typical values).



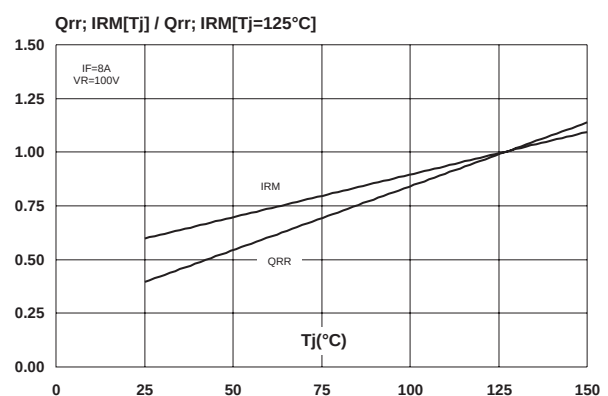
**Fig.8** : Reverse recovery charges versus  $di/dt$  (90% confidence).



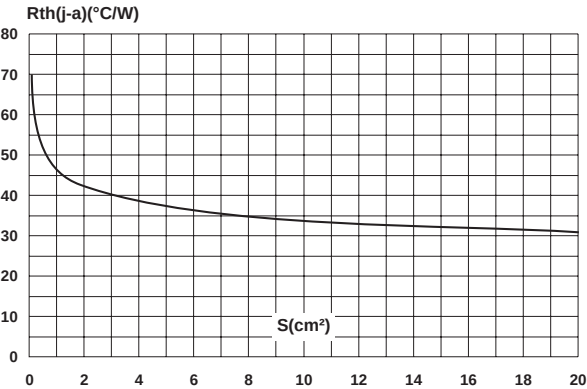
**Fig.9** : Peak reverse recovery current versus  $di/dt$  (90% confidence).



**Fig.10** : Dynamic parameters versus junction temperature.



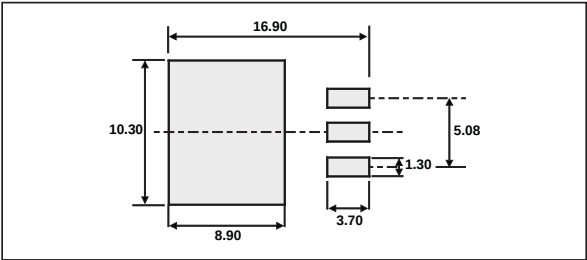
**Fig.11** : Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: 35μm) for D<sup>2</sup>PAK.



**PACKAGE MECHANICAL DATA**  
D<sup>2</sup>PAK (Plastic)

| REF. | DIMENSIONS  |       |            |       |
|------|-------------|-------|------------|-------|
|      | Millimeters |       | Inches     |       |
|      | Min.        | Max.  | Min.       | Max.  |
| A    | 4.40        | 4.60  | 0.173      | 0.181 |
| A1   | 2.49        | 2.69  | 0.098      | 0.106 |
| A2   | 0.03        | 0.23  | 0.001      | 0.009 |
| B    | 0.70        | 0.93  | 0.027      | 0.037 |
| B2   | 1.14        | 1.70  | 0.045      | 0.067 |
| C    | 0.45        | 0.60  | 0.017      | 0.024 |
| C2   | 1.23        | 1.36  | 0.048      | 0.054 |
| D    | 8.95        | 9.35  | 0.352      | 0.368 |
| E    | 10.00       | 10.40 | 0.393      | 0.409 |
| G    | 4.88        | 5.28  | 0.192      | 0.208 |
| L    | 15.00       | 15.85 | 0.590      | 0.624 |
| L2   | 1.27        | 1.40  | 0.050      | 0.055 |
| L3   | 1.40        | 1.75  | 0.055      | 0.069 |
| M    | 2.40        | 3.20  | 0.094      | 0.126 |
| R    | 0.40 typ.   |       | 0.016 typ. |       |
| V2   | 0°          | 8°    | 0°         | 8°    |

**FOOT PRINT (in millimeters)**



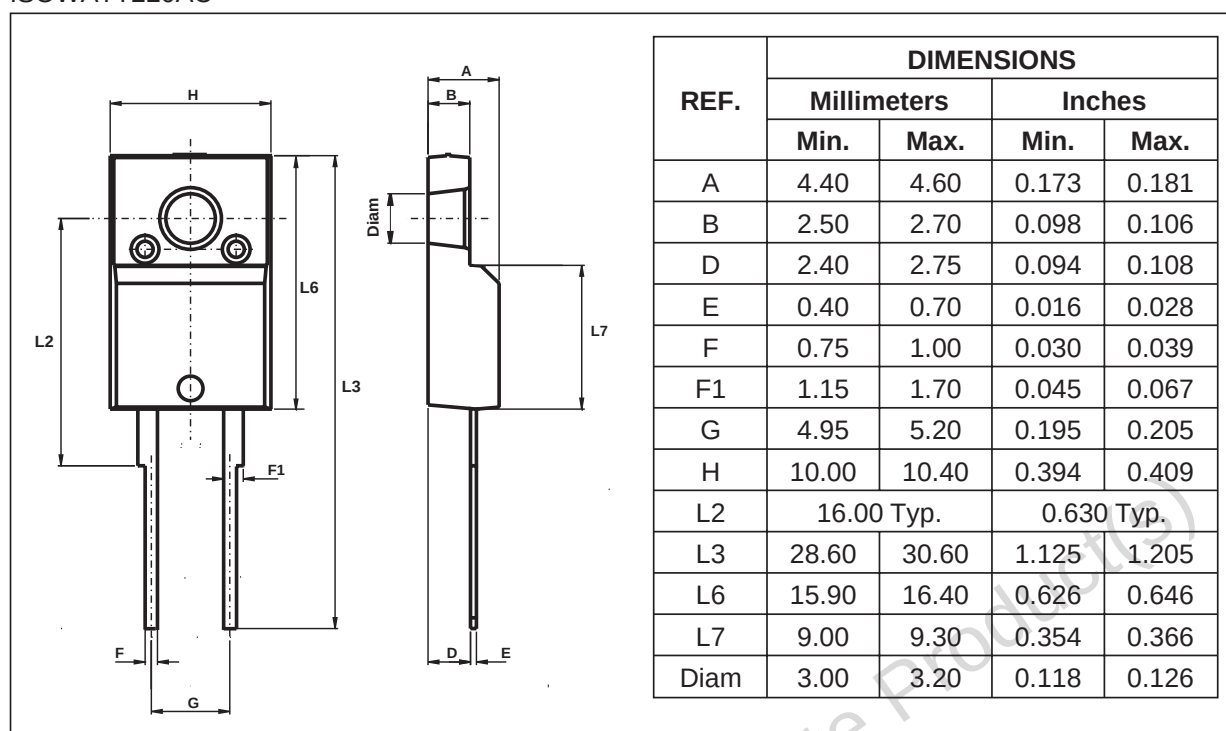
BYW29/F/FP/G-200

PACKAGE MECHANICAL DATA  
TO-220AC

| REF.    | DIMENSIONS  |       |            |       |
|---------|-------------|-------|------------|-------|
|         | Millimeters |       | Inches     |       |
|         | Min.        | Max.  | Min.       | Max.  |
| A       | 4.40        | 4.60  | 0.173      | 0.181 |
| C       | 1.23        | 1.32  | 0.048      | 0.051 |
| D       | 2.40        | 2.72  | 0.094      | 0.107 |
| E       | 0.49        | 0.70  | 0.019      | 0.027 |
| F       | 0.61        | 0.88  | 0.024      | 0.034 |
| F1      | 1.14        | 1.70  | 0.044      | 0.066 |
| G       | 4.95        | 5.15  | 0.194      | 0.202 |
| H2      | 10.00       | 10.40 | 0.393      | 0.409 |
| L2      | 16.40 typ.  |       | 0.645 typ. |       |
| L4      | 13.00       | 14.00 | 0.511      | 0.551 |
| L5      | 2.65        | 2.95  | 0.104      | 0.116 |
| L6      | 15.25       | 15.75 | 0.600      | 0.620 |
| L7      | 6.20        | 6.60  | 0.244      | 0.259 |
| L9      | 3.50        | 3.93  | 0.137      | 0.154 |
| M       | 2.6 typ.    |       | 0.102 typ. |       |
| Diam. I | 3.75        | 3.85  | 0.147      | 0.151 |

PACKAGE MECHANICAL DATA  
TO-220FPAC

| REF. | DIMENSIONS  |      |           |       |
|------|-------------|------|-----------|-------|
|      | Millimeters |      | Inches    |       |
|      | Min.        | Max. | Min.      | Max.  |
| A    | 4.4         | 4.6  | 0.173     | 0.181 |
| B    | 2.5         | 2.7  | 0.098     | 0.106 |
| D    | 2.5         | 2.75 | 0.098     | 0.108 |
| E    | 0.45        | 0.70 | 0.018     | 0.027 |
| F    | 0.75        | 1    | 0.030     | 0.039 |
| F1   | 1.15        | 1.70 | 0.045     | 0.067 |
| G    | 4.95        | 5.20 | 0.195     | 0.205 |
| G1   | 2.4         | 2.7  | 0.094     | 0.106 |
| H    | 10          | 10.4 | 0.393     | 0.409 |
| L2   | 16 Typ.     |      | 0.63 Typ. |       |
| L3   | 28.6        | 30.6 | 1.126     | 1.205 |
| L4   | 9.8         | 10.6 | 0.386     | 0.417 |
| L5   | 2.9         | 3.6  | 0.114     | 0.142 |
| L6   | 15.9        | 16.4 | 0.626     | 0.646 |
| L7   | 9.00        | 9.30 | 0.354     | 0.366 |
| Dia. | 3.00        | 3.20 | 0.118     | 0.126 |

**PACKAGE MECHANICAL DATA**  
**ISOWATT220AC**


| Type        | Marking     | Package            | Weight | Base Qty | Delivery Mode |
|-------------|-------------|--------------------|--------|----------|---------------|
| BYW29-200   | BYW29-200   | TO-220AC           | 1.86 g | 50       | Tube          |
| BYW29F-200  | BYW29F-200  | ISOWATT220AC       | 2.2 g  | 50       | Tube          |
| BYW29FP-200 | BYW29FP-200 | TO-220FPAC         | 2 g    | 50       | Tube          |
| BYW29G-200  | BYW29G-200  | D <sup>2</sup> PAK | 1.48 g | 50       | Tube          |

- Cooling method: by conduction (C)
- Recommended torque value (ISOWATT220AC, TO-220FPAC): 0.55 N.m
- Maximum torque value: 0.7 N.m
- Recommended torque value (TO-220AC): 0.8 N.m
- Maximum torque value: 1.0 N.m
- Epoxy meets UL94, V0

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