



## DTVseries

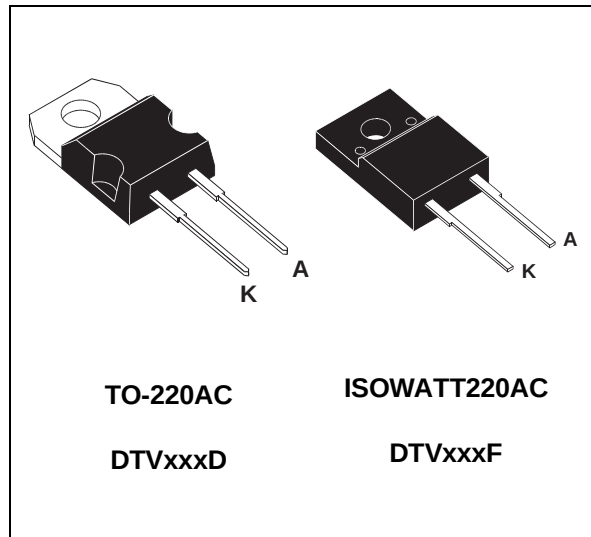
### (CRT HORIZONTAL DEFLECTION) HIGH VOLTAGE DAMPER DIODE

#### MAIN PRODUCTS CHARACTERISTICS

|             |                |
|-------------|----------------|
| $I_{F(AV)}$ | 5 A to 10 A    |
| $V_{RRM}$   | 1500 V         |
| $V_F$       | 1.3 V to 1.5 V |

#### FEATURES AND BENEFITS

- HIGH BREAKDOWN VOLTAGE CAPABILITY
- VERY FAST RECOVERY DIODE
- SPECIFIED TURN ON SWITCHING CHARACTERISTICS
- LOW STATIC AND PEAK FORWARD VOLTAGE DROP FOR LOW DISSIPATION
- SUITED TO 32-110kHz MONITORS AND 16kHz TV DEFLECTION
- INSULATED VERSION (ISOWATT220AC):  
Insulating voltage = 2000V DC  
Capacitance = 12pF
- PLANAR TECHNOLOGY ALLOWING HIGH QUALITY AND BEST ELECTRICAL CHARACTERISTICS



#### DESCRIPTION

High voltage diode with high current capability dedicated to horizontal deflection. DTV16 is optimized to TV meanwhile DTV32 to DTV110 are covering the full range of monitors from the low end to the professional hi-definition SXGA CAD display units.

These devices are packaged either in TO220-AC or in ISOWATT220AC.

#### ABSOLUTE RATINGS

| Symbol       | Parameter                                                        |        | Value      | Unit |
|--------------|------------------------------------------------------------------|--------|------------|------|
| $V_{RRM}$    | Repetitive peak reverse voltage                                  |        | 1500       | V    |
| $I_{F(RMS)}$ | RMS forward current                                              |        | 15         | A    |
| $I_{FSM}$    | Surge non repetitive forward current<br>tp = 10ms half sine wave | DTV16  | 50         | A    |
|              |                                                                  | DTV32  | 75         |      |
|              |                                                                  | DTV56  | 80         |      |
|              |                                                                  | DTV64  | 80         |      |
|              |                                                                  | DTV82  | 80         |      |
|              |                                                                  | DTV110 | 80         |      |
| $T_{stg}$    | Storage temperature range                                        |        | -65 to 150 | °C   |
| $T_j$        | Maximum operating junction temperature                           |        | 150        | °C   |

## DTVseries

### THERMAL RESISTANCES

| Symbol        | Parameter                           |        | Value    |              | Unit |
|---------------|-------------------------------------|--------|----------|--------------|------|
|               |                                     |        | TO-220AC | ISOWATT220AC |      |
| $R_{th(j-c)}$ | Junction to case thermal resistance | DTV16  | 3        | 5.5          | °C/W |
|               |                                     | DTV32  | 2.5      | 4.75         |      |
|               |                                     | DTV56  | 2        | 4            |      |
|               |                                     | DTV64  | 1.8      | 4            |      |
|               |                                     | DTV82  | 1.6      | 3.7          |      |
|               |                                     | DTV110 | 1.3      | 3.5          |      |

### STATIC ELECTRICAL CHARACTERISTICS

| Symbol | Test Conditions |        | Value     |     |            |      | Unit |
|--------|-----------------|--------|-----------|-----|------------|------|------|
|        |                 |        | Tj = 25°C |     | Tj = 125°C |      |      |
|        |                 |        | Typ       | Max | Typ        | Max  |      |
| VF *   | IF = 5 A        | DTV16  |           | 1.6 | 1.0        | 1.5  | V    |
|        | IF = 6 A        | DTV32  |           | 1.5 | 1.1        | 1.35 |      |
|        | IF = 6 A        | DTV56  |           | 1.8 | 1.1        | 1.5  |      |
|        | IF = 6 A        | DTV64  |           | 1.7 | 1.1        | 1.4  |      |
|        | IF = 6 A        | DTV82  |           | 1.8 | 1.0        | 1.3  |      |
|        | IF = 10 A       | DTV110 |           | 2.3 | 1.15       | 1.5  |      |
| IR **  | VR = VRRM       | DTV16  |           | 60  | 100        | 500  | μA   |
|        |                 | DTV32  |           | 100 | 100        | 1000 |      |
|        |                 | DTV56  |           | 100 | 100        | 1000 |      |
|        |                 | DTV64  |           | 100 | 100        | 1000 |      |
|        |                 | DTV82  |           | 100 | 100        | 1000 |      |
|        |                 | DTV110 |           | 100 | 100        | 1000 |      |

pulse test : \*  $t_p = 380 \mu s$ ,  $\delta < 2\%$

\*\*  $t_p = 5 ms$ ,  $\delta < 2\%$

## RECOVERY CHARACTERISTICS

| Symbol   | Test Conditions                                                                |                          |        | Typ  | Max | Unit |
|----------|--------------------------------------------------------------------------------|--------------------------|--------|------|-----|------|
| $t_{rr}$ | $I_F = 100\text{mA}$<br>$I_R = 100\text{mA}$<br>$I_{RR} = 10\text{mA}$         | $T_j = 25^\circ\text{C}$ | DTV16  | 1500 |     | ns   |
|          |                                                                                |                          | DTV32  | 850  |     |      |
|          |                                                                                |                          | DTV56  | 750  |     |      |
|          |                                                                                |                          | DTV64  | 750  |     |      |
|          |                                                                                |                          | DTV82  | 675  |     |      |
|          |                                                                                |                          | DTV110 | 625  |     |      |
| $t_{rr}$ | $I_F = 1\text{A}$<br>$dI_F/dt = -50\text{A}/\mu\text{s}$<br>$V_R = 30\text{V}$ | $T_j = 25^\circ\text{C}$ | DTV16  | 200  | 300 | ns   |
|          |                                                                                |                          | DTV32  | 130  | 175 |      |
|          |                                                                                |                          | DTV56  | 110  | 135 |      |
|          |                                                                                |                          | DTV64  | 110  | 135 |      |
|          |                                                                                |                          | DTV82  | 105  | 125 |      |
|          |                                                                                |                          | DTV110 | 95   | 115 |      |

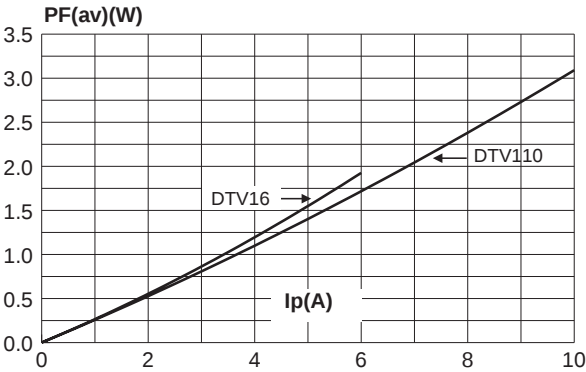
## TURN-ON SWITCHING CHARACTERISTICS

| Symbol   | Test Conditions                                                                 |                           |        | Typ | Max | Unit |
|----------|---------------------------------------------------------------------------------|---------------------------|--------|-----|-----|------|
| $t_{fr}$ | $I_F = 6\text{A}$<br>$dI_F/dt = 80\text{A}/\mu\text{s}$<br>$V_{FR} = 3\text{V}$ | $T_j = 100^\circ\text{C}$ | DTV16  | 350 |     | ns   |
|          |                                                                                 |                           | DTV32  | 570 |     |      |
|          |                                                                                 |                           | DTV56  | 350 |     |      |
|          |                                                                                 |                           | DTV64  | 350 |     |      |
|          |                                                                                 |                           | DTV82  | 270 |     |      |
|          |                                                                                 |                           | DTV110 | 250 |     |      |
| $V_{FP}$ | $I_F = 6\text{A}$<br>$dI_F/dt = 80\text{A}/\mu\text{s}$                         | $T_j = 100^\circ\text{C}$ | DTV16  | 25  | 34  | V    |
|          |                                                                                 |                           | DTV32  | 21  | 28  |      |
|          |                                                                                 |                           | DTV56  | 19  | 26  |      |
|          |                                                                                 |                           | DTV64  | 18  | 22  |      |
|          |                                                                                 |                           | DTV82  | 14  | 18  |      |
|          |                                                                                 |                           | DTV110 | 11  | 14  |      |

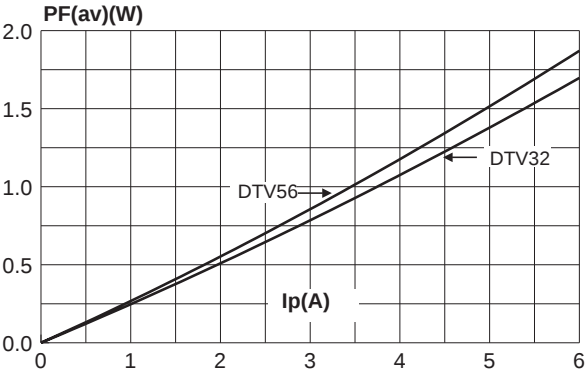
To evaluate the maximum conduction losses use the following equation :

|        |                                                        |
|--------|--------------------------------------------------------|
| DTV16  | $P = 1.14 \times I_{F(AV)} + 0.072 \times I_F^2(RMS)$  |
| DTV32  | $P = 1.069 \times I_{F(AV)} + 0.047 \times I_F^2(RMS)$ |
| DTV56  | $P = 1.15 \times I_{F(AV)} + 0.059 \times I_F^2(RMS)$  |
| DTV64  | $P = 1.06 \times I_{F(AV)} + 0.053 \times I_F^2(RMS)$  |
| DTV82  | $P = 1.01 \times I_{F(AV)} + 0.048 \times I_F^2(RMS)$  |
| DTV110 | $P = 1.12 \times I_{F(AV)} + 0.038 \times I_F^2(RMS)$  |

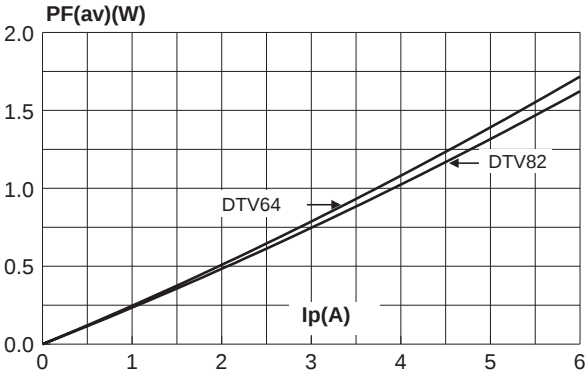
**Fig. 1-1:** Power dissipation versus peak forward current (triangular waveform,  $\delta=0.45$ ).



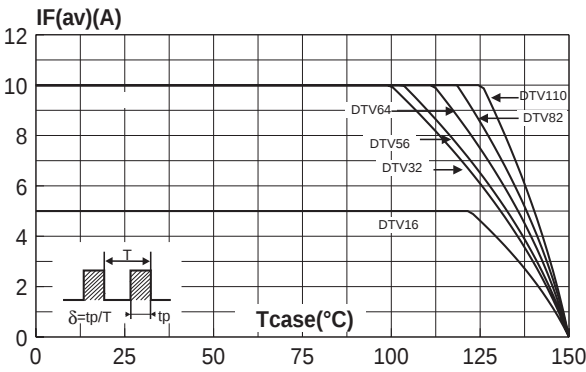
**Fig. 1-2:** Power dissipation versus peak forward current (triangular waveform,  $\delta=0.45$ ).



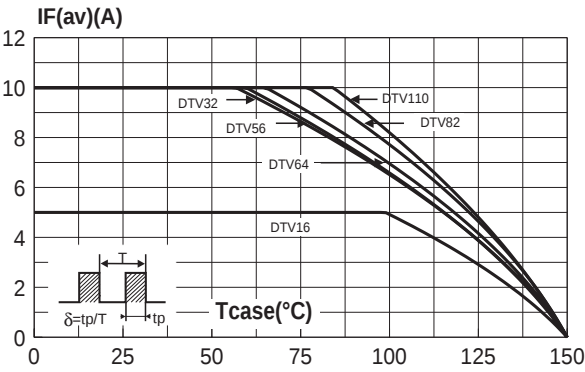
**Fig. 1-3:** Power dissipation versus peak forward current (triangular waveform,  $\delta=0.45$ ).



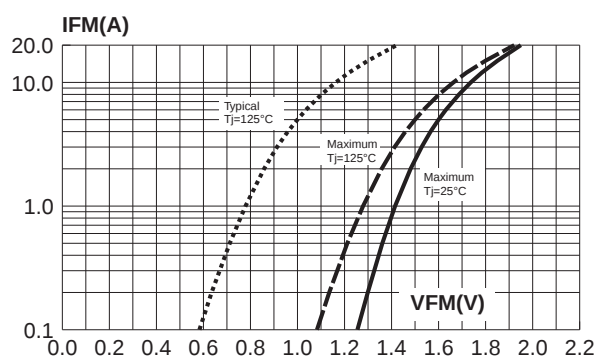
**Fig. 2-1:** Average current versus case temperature ( $\delta=0.5$ ) (TO-220AC).



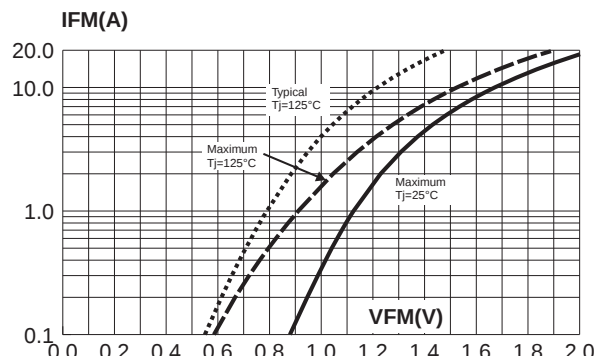
**Fig. 2-2:** Average current versus case temperature ( $\delta=0.5$ ) (ISOWATT220AC).



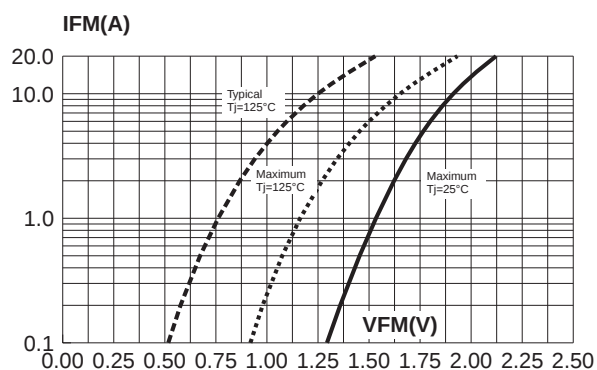
**Fig. 3-1:** Forward voltage drop versus forward current (DTV16D/F).



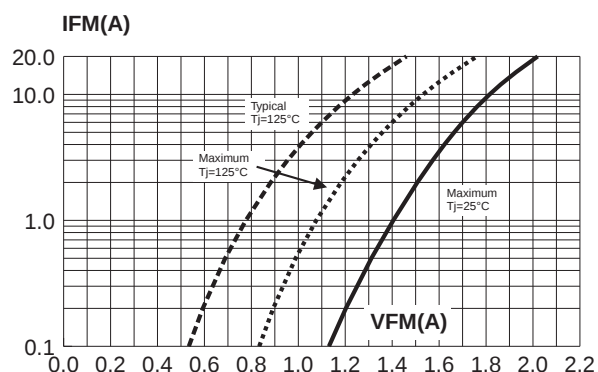
**Fig. 3-2:** Forward voltage drop versus forward current (DTV32D/F).



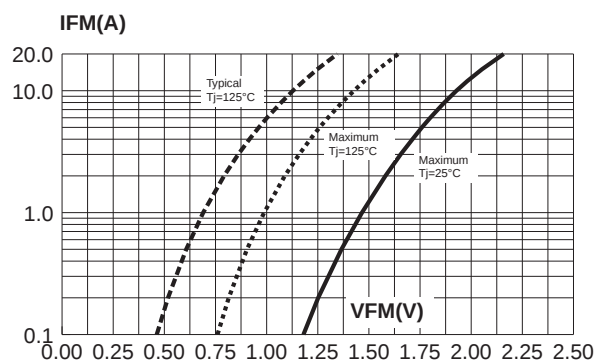
**Fig. 3-3:** Forward voltage drop versus forward current (DTV56D/F).



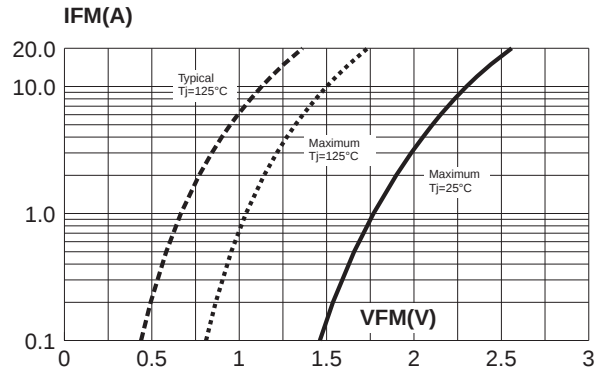
**Fig. 3-4:** Forward voltage drop versus forward current (DTV64D/F).



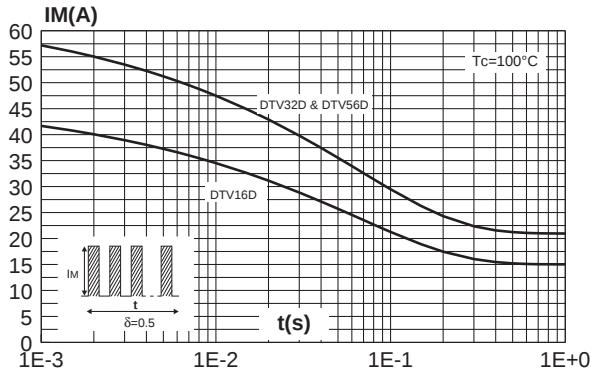
**Fig. 3-5:** Forward voltage drop versus forward current (DTV82D/F).



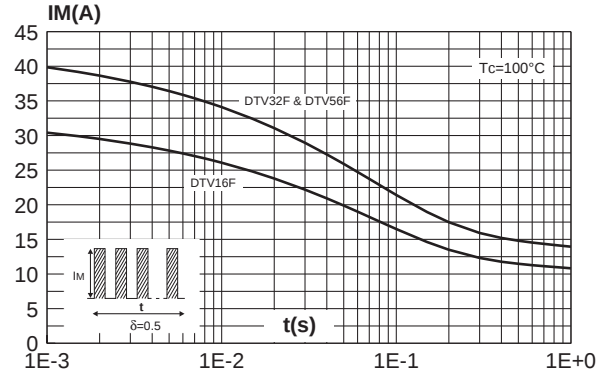
**Fig. 3-6:** Forward voltage drop versus forward current (DTV110D/F).



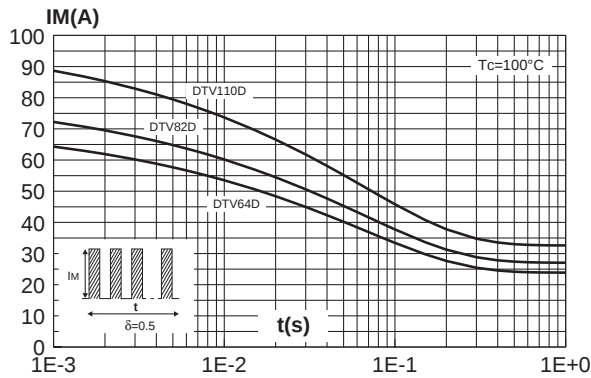
**Fig. 4-1:** Non repetitive surge peak forward current versus overload duration (TO-220AC) (DTV16D / DTV32D / DTV56D).



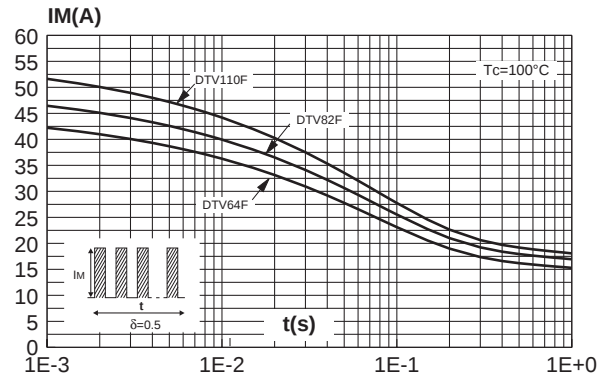
**Fig. 4-2:** Non repetitive surge peak forward current versus overload duration (ISOWATT220AC) (DTV16F / DTV32F / DTV56F).



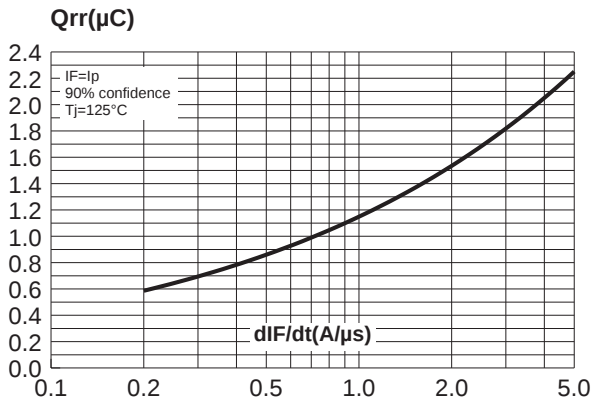
**Fig. 4-3:** Non repetitive surge peak forward current versus overload duration (TO-220AC) (DTV64D / DTV82D / DTV110D).



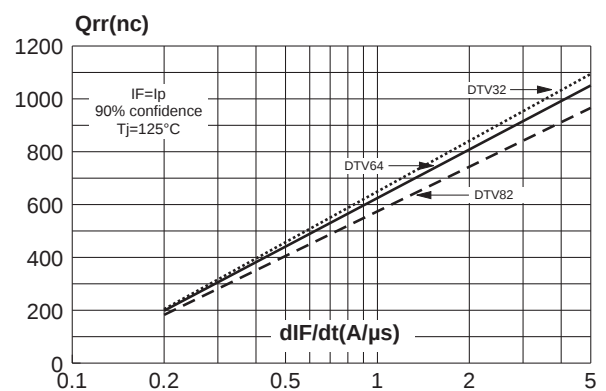
**Fig. 4-4:** Non repetitive surge peak forward current versus overload duration (ISOWATT220AC) (DTV64F / DTV82F / DTV110F).

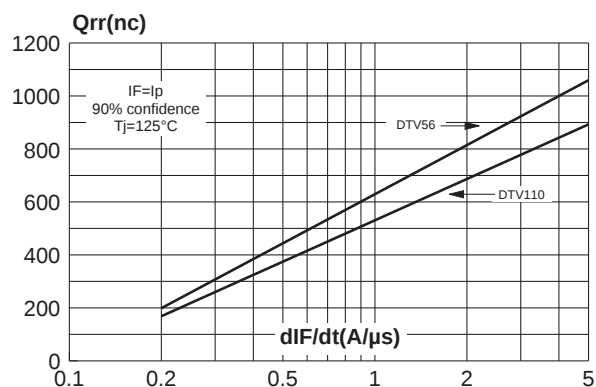
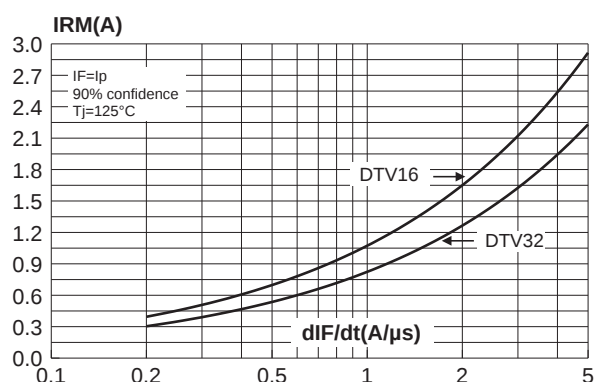
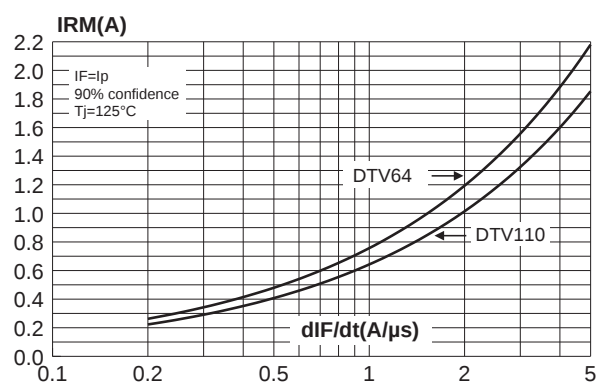
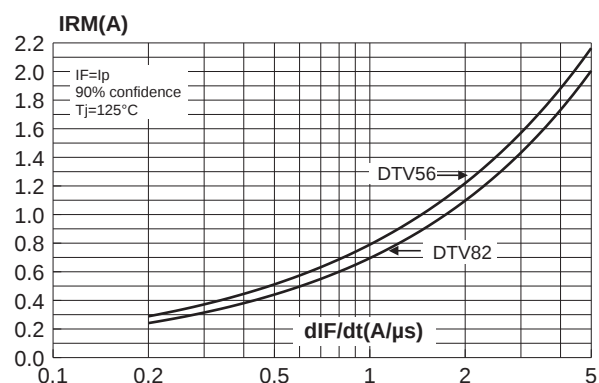
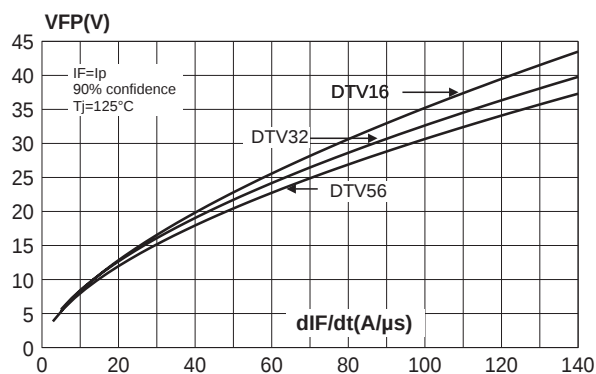
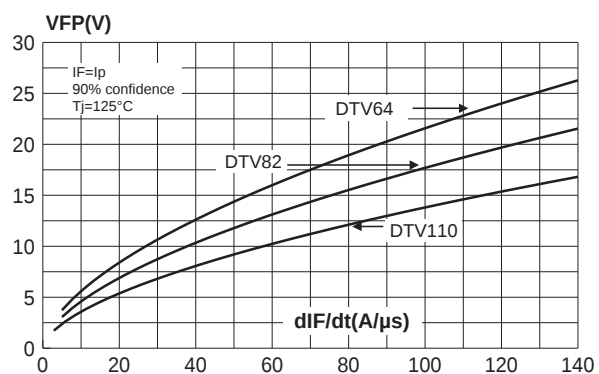


**Fig. 5.1:** Reverse recovery charges versus  $dI_F/dt$  (DTV16D/F).

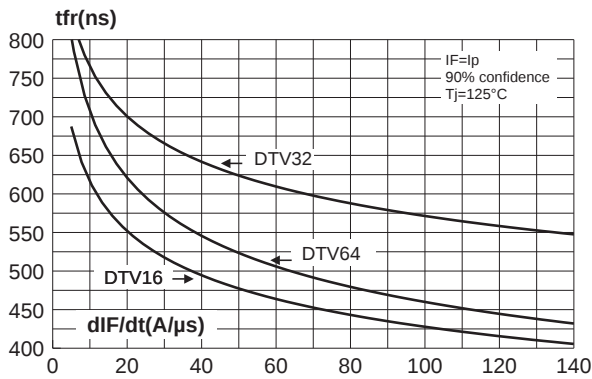


**Fig. 5.2:** Reverse recovery charges versus  $dI_F/dt$ .

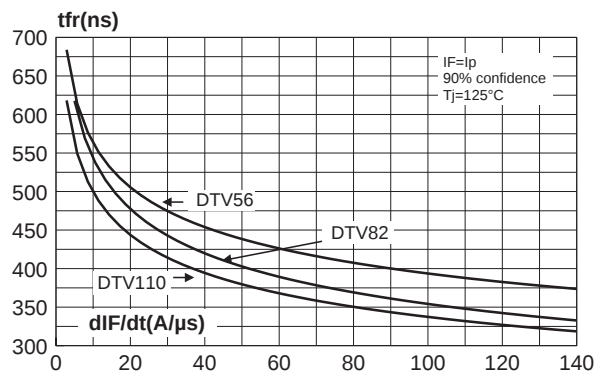


**Fig. 5.3:** Reverse recovery charges versus  $dI_F/dt$ .**Fig. 6.1:** Reverse recovery current versus  $dI_F/dt$ .**Fig. 6.2:** Reverse recovery current versus  $dI_F/dt$ .**Fig. 6.3:** Reverse recovery current versus  $dI_F/dt$ .**Fig. 7-1:** Transient peak forward voltage versus  $dI_F/dt$ .**Fig. 7.2:** Transient peak forward voltage versus  $dI_F/dt$ .

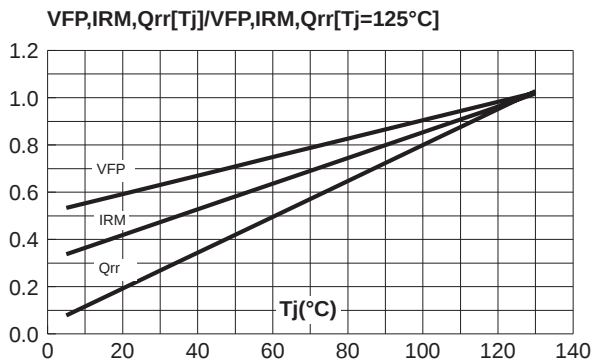
**Fig. 8.1:** Forward recovery time versus  $dI_F/dt$ .



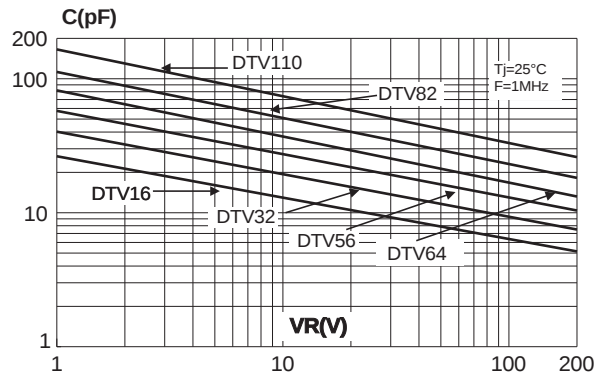
**Fig. 8-2:** Forward recovery time versus  $dI_F/dt$ .



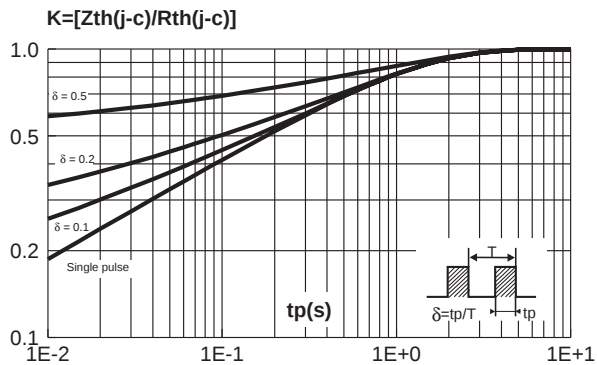
**Fig. 9:** Dynamic parameters versus junction temperature.



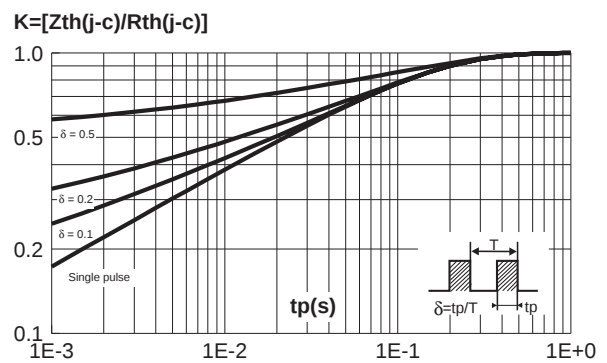
**Fig. 10:** Junction capacitance versus reverse voltage applied (typical values).



**Fig. 11-1:** Relative variation of thermal impedance junction to case versus pulse duration (ISOWATT220AC).

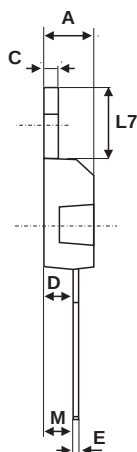
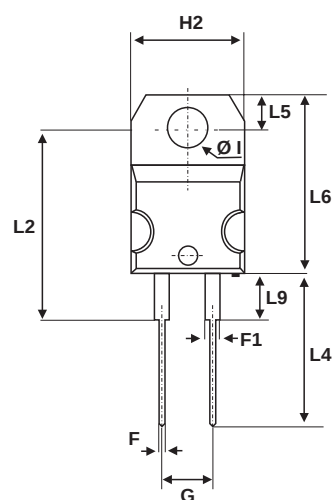


**Fig. 12-2:** Relative variation of thermal impedance junction to case versus pulse duration (TO-220AC).



**PACKAGE DATA**

TO-220AC (plastic) (JEDEC outline)



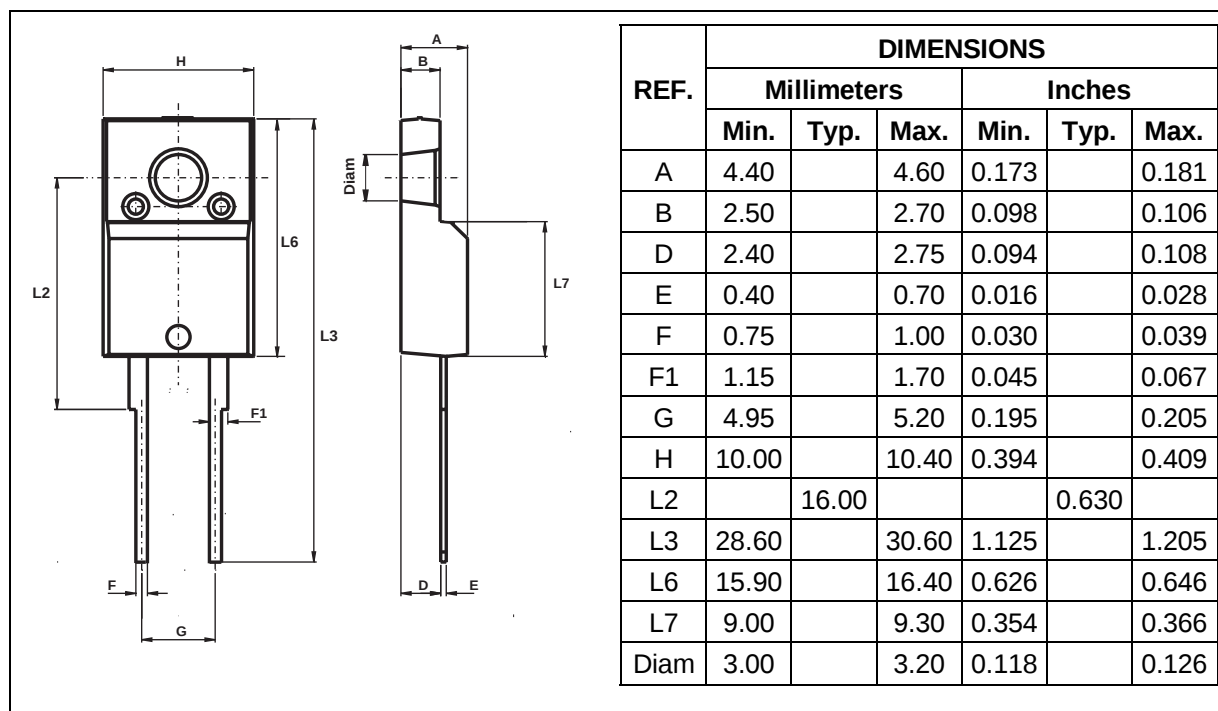
| REF.    | DIMENSIONS  |       |            |       |
|---------|-------------|-------|------------|-------|
|         | Millimeters |       | Inches     |       |
|         | Min.        | Max.  | Min.       | Max.  |
| A       | 4.40        | 4.60  | 0.173      | 0.181 |
| C       | 1.23        | 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 |

- Cooling method : c.
- Torque value : 0.55 m.N typ (0.70 m.N max).

## DTVseries

### PACKAGE DATA

ISOWATT220AC (plastic)



■ Cooling method : C.

■ Electrical isolation : 2000V DC

■ Torque value : 0.55 m.N typ (0.70 m.N max).

■ Capacitance : 12 pF

| Ordering code                                             | Marking                                                   | Package      | Weight | Base qty | Delivery mode |
|-----------------------------------------------------------|-----------------------------------------------------------|--------------|--------|----------|---------------|
| DTV16D<br>DTV32D<br>DTV56D<br>DTV64D<br>DTV82D<br>DTV110D | DTV16D<br>DTV32D<br>DTV56D<br>DTV64D<br>DTV82D<br>DTV110D | TO-220AC     | 1.86g  | 50       | Tube          |
| DTV16F<br>DTV32F<br>DTV56F<br>DTV64F<br>DTV82F<br>DTV110F | DTV16F<br>DTV32F<br>DTV56F<br>DTV64F<br>DTV82F<br>DTV110F | ISOWATT220AC | 2g     | 50       | Tube          |

■ Epoxy meets UL94, V0

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