advanced

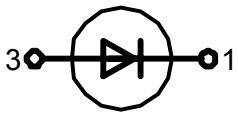
# Sonic-FRD

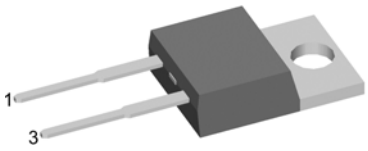
$V_{RRM}$ = 600 V
$I_{FAV}$ = 10 A
$t_{rr}$ = 35 ns

High Performance Fast Recovery Diode
Low Loss and Soft Recovery
Single Diode

**Part number** *(Marking on product)*

DHG 10 I 600PA




**Features / Advantages:**

- Planar passivated chips
- Very low leakage current
- Very short recovery time
- Improved thermal behaviour
- Very low Irm-values
- Very soft recovery behaviour
- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low Irm reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

**Applications:**

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode
- Rectifiers in switch mode power supplies (SMPS)
- Uninterruptible power supplies (UPS)

**Package:**

TO-220AC
- Industry standard outline
- Epoxy meets UL 94V-0
- RoHS compliant

| Symbol | Definition | Conditions | | Ratings min. | typ. | max. | Unit |
|---|---|---|---|---|---|---|---|
| $V_{RRM}$ | *max. repetitive reverse voltage* | | $T_{VJ}$ = 25 °C | | | 600 | V |
| $I_R$ | *reverse current* | $V_R$ = 600 V | $T_{VJ}$ = 25 °C | | | 15 | µA |
| | | $V_R$ = 600 V | $T_{VJ}$ = 125 °C | | | 1.5 | mA |
| $V_F$ | *forward voltage* | $I_F$ = 10 A | $T_{VJ}$ = 25 °C | | | 2.35 | V |
| | | $I_F$ = 20 A | | | | | V |
| | | $I_F$ = 10 A | $T_{VJ}$ = 125 °C | | | 2.20 | V |
| | | $I_F$ = 20 A | | | | | V |
| $I_{FAV}$ | *average forward current* | rectangular, d = 0.5 | $T_C$ = 95 °C | | | 10 | A |
| $V_{F0}$ | *threshold voltage* } *for power loss calculation only* | | $T_{VJ}$ = 150 °C | | | 1.20 | V |
| $r_F$ | *slope resistance* } | | | | | 93 | mΩ |
| $R_{thJC}$ | *thermal resistance junction to case* | | | | | 1.80 | K/W |
| $T_{VJ}$ | *virtual junction temperature* | | | -55 | | 150 | °C |
| $P_{tot}$ | *total power dissipation* | | $T_C$ = 25 °C | | | 70 | W |
| $I_{FSM}$ | *max. forward surge current* | $t_p$ = 10 ms (50 Hz), sine | $T_{VJ}$ = 45 °C | | | 100 | A |
| $I_{RM}$ | *max. reverse recovery current* | $I_F$ = 10 A; | $T_{VJ}$ = 25 °C | | 4 | | A |
| | | | $T_{VJ}$ = 125 °C | | | | A |
| $t_{rr}$ | *reverse recovery time* | $-di_F/dt$ = 200 A/µs | $T_{VJ}$ = 25 °C | | 35 | | ns |
| | | $V_R$ = 400 V | $T_{VJ}$ = 125 °C | | | | ns |
| $C_J$ | *junction capacitance* | $V_R$ = 300 V; f = 1 MHz | $T_{VJ}$ = 25 °C | | | | pF |
| $E_{AS}$ | *non-repetitive avalanche energy* | $I_{AS}$ = A; L = 100 µH | $T_{VJ}$ = 25 °C | | | tbd | mJ |
| $I_{AR}$ | *repetitive avalanche current* | $V_A = 1.5 \cdot V_R$ typ.; f = 10 kHz | | | | tbd | A |

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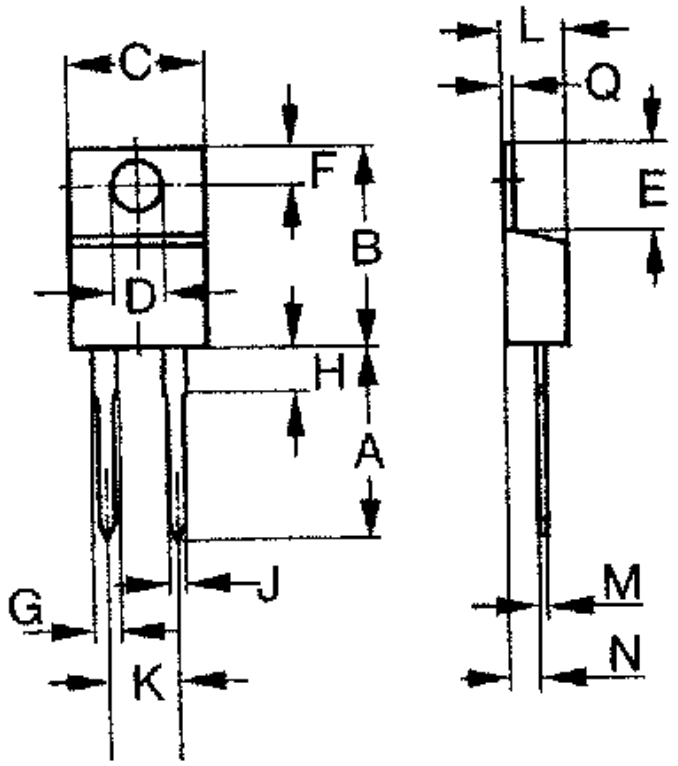
| Symbol | Definition | Conditions | Ratings min. | typ. | max. | Unit |
|---|---|---|---|---|---|---|
| $I_{RMS}$ | *RMS current* | per pin* | | | 35 | A |
| $R_{thCH}$ | *thermal resistance case to heatsink* | | | 0.50 | | K/W |
| $M_D$ | *mounting torque* | | 0.4 | | 0.6 | Nm |
| $F_C$ | *mounting force with clip* | | 20 | | 60 | N |
| $T_{stg}$ | *storage temperature* | | -55 | | 150 | °C |
| **Weight** | | | | 2 | | g |

* Irms is typically limited by: 1. pin-to-chip resistance; or by 2. current capability of the chip.
In case of 1, a common cathode/anode configuration and a non-isolated backside, the whole current capability can be used by connecting the backside.

**Outlines TO-220AC**




| Dim. | Millimeter Min. | Max. | Inches Min. | Max. |
|---|---|---|---|---|
| A | 12.70 | 14.73 | 0.500 | 0.580 |
| B | 14.23 | 16.51 | 0.560 | 0.650 |
| C | 9.66 | 10.66 | 0.380 | 0.420 |
| D | 3.54 | 4.08 | 0.139 | 0.161 |
| E | 5.85 | 6.85 | 2.300 | 0.420 |
| F | 2.54 | 3.42 | 0.100 | 0.135 |
| G | 1.15 | 1.77 | 0.045 | 0.070 |
| H | - | 6.35 | - | 0.250 |
| J | 0.64 | 0.89 | 0.025 | 0.035 |
| K | 4.83 | 5.33 | 0.190 | 0.210 |
| L | 3.56 | 4.82 | 0.140 | 0.190 |
| M | 0.51 | 0.76 | 0.020 | 0.030 |
| N | 2.04 | 2.49 | 0.080 | 0.115 |
| Q | 0.64 | 1.39 | 0.025 | 0.055 |