



preliminary

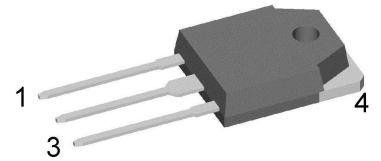
# Sonic Fast Recovery Diode

$V_{RRM} = 600\text{ V}$   
 $I_{FAV} = 2 \times 10\text{ A}$   
 $t_{rr} = 35\text{ ns}$

High Performance Fast Recovery Diode  
 Low Loss and Soft Recovery  
 Common Cathode

Part number

**DHG20C600QB**



Backside: cathode



### Features / Advantages:

- Planar passivated chips
- Very low leakage current
- Very short recovery time
- Improved thermal behaviour
- Very low  $I_{rm}$ -values
- Very soft recovery behaviour
- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low  $I_{rm}$  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-3P

- Industry standard outline compatible with TO-247
- RoHS compliant
- Epoxy meets UL 94V-0

### Disclaimer Notice

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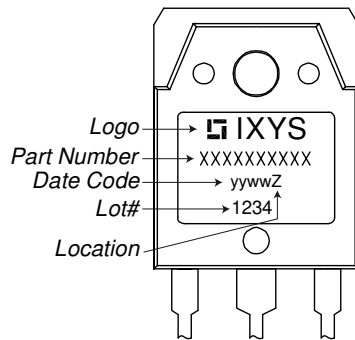
| Fast Diode |  |   |                              | Ratings |      |            |  |
|------------|--|---|------------------------------|---------|------|------------|--|
| Symbol     | Definition                                   | Conditions  | min.                         | typ.    | max. | Unit       |  |
| $V_{RSM}$  | max. non-repetitive reverse blocking voltage | $T_{VJ} = 25^{\circ}C$                                    |                              |         | 600  | V          |  |
| $V_{RRM}$  | max. repetitive reverse blocking voltage     | $T_{VJ} = 25^{\circ}C$                                    |                              |         | 600  | V          |  |
| $I_R$      | reverse current, drain current               | $V_R = 600 V$   | $T_{VJ} = 25^{\circ}C$       |         | 15   | $\mu A$    |  |
|            |  | $V_R = 600 V$   | $T_{VJ} = 125^{\circ}C$      |         | 1.2  | mA         |  |
| $V_F$      | forward voltage drop                         | $I_F = 10 A$  | $T_{VJ} = 25^{\circ}C$       |         | 2.22 | V          |  |
|            |  | $I_F = 20 A$  |                              |         | 3.12 | V          |  |
|            |  | $I_F = 10 A$  | $T_{VJ} = 125^{\circ}C$      |         | 2.17 | V          |  |
|            |  | $I_F = 20 A$  |                              |         | 3.27 | V          |  |
| $I_{FAV}$  | average forward current                      | $T_C = 95^{\circ}C$<br>rectangular $d = 0.5$              | $T_{VJ} = 150^{\circ}C$      |         | 10   | A          |  |
| $V_{FO}$   | threshold voltage                            | } for power loss calculation only                         | $T_{VJ} = 150^{\circ}C$      |         | 1.04 | V          |  |
| $r_F$      | slope resistance                             |   |                              |         | 104  | m $\Omega$ |  |
| $R_{thJC}$ | thermal resistance junction to case          |   |                              |         | 1.8  | K/W        |  |
| $R_{thCH}$ | thermal resistance case to heatsink          |   |                              | 0.3     |      | K/W        |  |
| $P_{tot}$  | total power dissipation                      |   | $T_C = 25^{\circ}C$          |         | 70   | W          |  |
| $I_{FSM}$  | max. forward surge current                   | $t = 10 ms; (50 Hz), sine; V_R = 0 V$                     | $T_{VJ} = 45^{\circ}C$       |         | 80   | A          |  |
| $C_J$      | junction capacitance                         | $V_R = 400 V$ $f = 1 MHz$                                 | $T_{VJ} = 25^{\circ}C$       |         | 6    | pF         |  |
| $I_{RM}$   | max. reverse recovery current                | } $I_F = 10 A; V_R = 400 V$<br>$-di_F / dt = 200 A/\mu s$ | $T_{VJ} = 25^{\circ}C$       |         | 4    | A          |  |
|            |  |   | $T_{VJ} = \text{ }^{\circ}C$ |         | tbd  | A          |  |
| $t_{rr}$   | reverse recovery time                        |   | $T_{VJ} = 25^{\circ}C$       |         | 35   | ns         |  |
|            |  |   | $T_{VJ} = \text{ }^{\circ}C$ |         | tbd  | ns         |  |



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| Package TO-3P |                              |                            | Ratings |      |      |      |
|---------------|------------------------------|----------------------------|---------|------|------|------|
| Symbol        | Definition                   | Conditions                 | min.    | typ. | max. | Unit |
| $I_{RMS}$     | RMS current                  | per terminal <sup>1)</sup> |         |      | 50   | A    |
| $T_{VJ}$      | virtual junction temperature |                            | -55     |      | 150  | °C   |
| $T_{op}$      | operation temperature        |                            | -55     |      | 125  | °C   |
| $T_{stg}$     | storage temperature          |                            | -55     |      | 150  | °C   |
| <b>Weight</b> |                              |                            |         | 5    |      | g    |
| $M_D$         | mounting torque              |                            | 0.8     |      | 1.2  | Nm   |
| $F_C$         | mounting force with clip     |                            | 20      |      | 120  | N    |

**Product Marking**



**Part description**

- D = Diode
- H = Sonic Fast Recovery Diode
- G = extreme fast
- 20 = Current Rating [A]
- C = Common Cathode
- 600 = Reverse Voltage [V]
- QB = TO-3P (3)

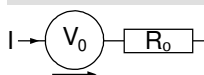
| Ordering | Ordering Number | Marking on Product | Delivery Mode | Quantity | Code No. |
|----------|-----------------|--------------------|---------------|----------|----------|
| Standard | DHG20C600QB     | DHG20C600QB        | Tube          | 30       | 503856   |

| Similar Part | Package      | Voltage class |
|--------------|--------------|---------------|
| DHG20C600PB  | TO-220AB (3) | 600           |

**Equivalent Circuits for Simulation**

*\* on die level*

$T_{VJ} = 150^{\circ}C$

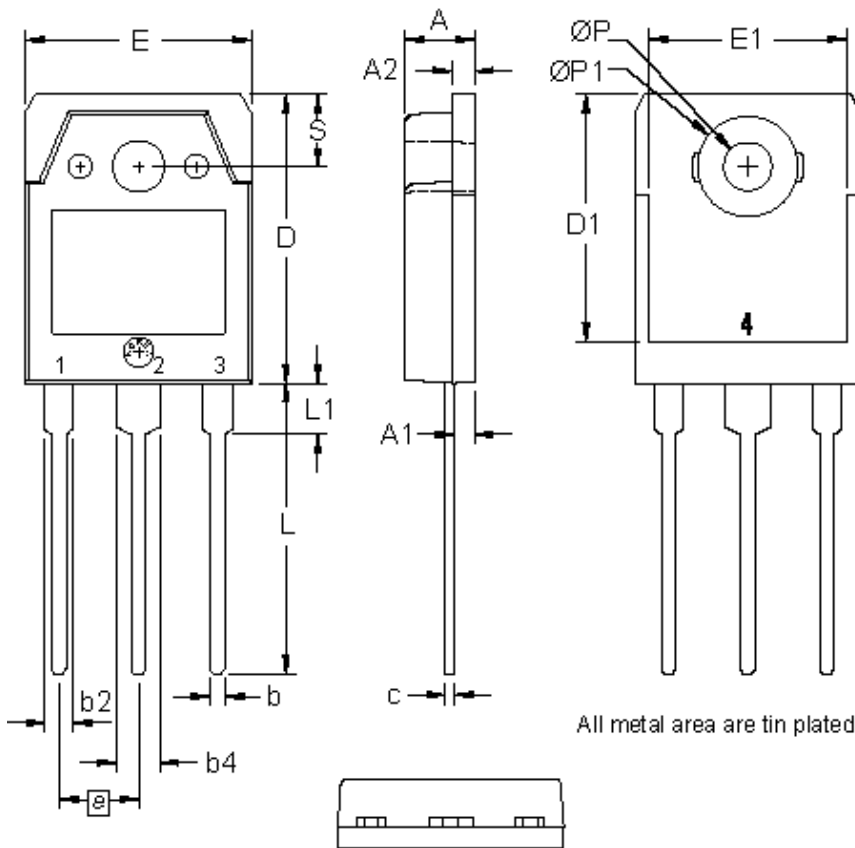


**Fast Diode**

|              |                    |      |    |
|--------------|--------------------|------|----|
| $V_{0\ max}$ | threshold voltage  | 1.04 | V  |
| $R_{0\ max}$ | slope resistance * | 101  | mΩ |



**Outlines TO-3P**



| Dim. | Millimeter |       | Inches    |       |
|------|------------|-------|-----------|-------|
|      | min        | max   | min       | max   |
| A    | 4.70       | 4.90  | 0.185     | 0.193 |
| A1   | 1.30       | 1.50  | 0.051     | 0.059 |
| A2   | 1.45       | 1.65  | 0.057     | 0.065 |
| b    | 0.90       | 1.15  | 0.035     | 0.045 |
| b2   | 1.90       | 2.20  | 0.075     | 0.087 |
| b4   | 2.90       | 3.20  | 0.114     | 0.126 |
| c    | 0.55       | 0.80  | 0.022     | 0.031 |
| D    | 19.80      | 20.10 | 0.780     | 0.791 |
| D1   | 16.90      | 17.20 | 0.665     | 0.677 |
| E    | 15.50      | 15.80 | 0.610     | 0.622 |
| E1   | 13.50      | 13.70 | 0.531     | 0.539 |
| e    | 5.45 BSC   |       | 0.215 BSC |       |
| L    | 19.80      | 20.20 | 0.780     | 0.795 |
| L1   | 3.40       | 3.60  | 0.134     | 0.142 |
| Ø P  | 3.20       | 3.40  | 0.126     | 0.134 |
| ØP1  | 6.90       | 7.10  | 0.272     | 0.280 |
| S    | 4.90       | 5.10  | 0.193     | 0.201 |

