



STTH8R06D/FP/G/R

TURBO 2 ULTRAFAST HIGH VOLTAGE RECTIFIER

MAIN PRODUCT CHARACTERISTICS

| | |
|----------------|--------|
| $I_{F(AV)}$ | 8 A |
| V_{RRM} | 600 V |
| $I_{RM}(typ.)$ | 5.5A |
| $T_j(max)$ | 175 °C |
| $V_F(max)$ | 1.8 V |
| $t_{rr}(max)$ | 45 ns |

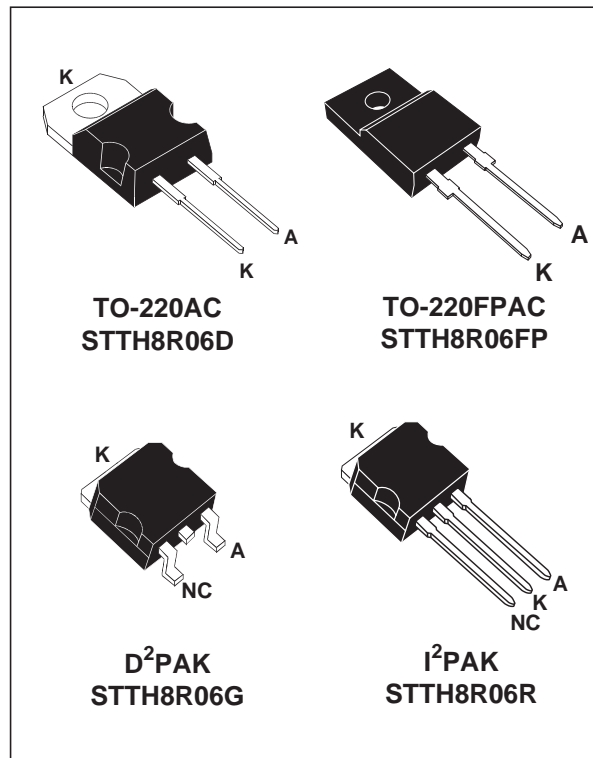
FEATURES AND BENEFITS

- Ultrafast switching
- Low reverse recovery current
- Reduces switching losses
- Low thermal resistance

DESCRIPTION

The STTH8R06D/FP/G/R, which is using ST 600V technology, is specially suited as boost diode in continuous mode power factor corrections and hard switching conditions.

The device is also intended for use as a free wheeling diode in power supplies and other power switching applications.



ABSOLUTE RATINGS (limiting values)

| Symbol | Parameter | | Value | Unit |
|--------------|--|--|------------|------|
| V_{RRM} | Repetitive peak reverse voltage | | 600 | V |
| $I_{F(RMS)}$ | RMS forward current | | 30 | A |
| $I_{F(AV)}$ | Average forward current $\delta = 0.5$ | TO-220AC $T_c = 130^\circ\text{C}$ D ² PAK / I ² PAK $T_c = 130^\circ\text{C}$ TO-220FPAC $T_c = 85^\circ\text{C}$ | 8 | A |
| I_{FSM} | Surge non repetitive forward current | $t_p = 10\text{ ms}$ Sinusoidal | 80 | A |
| T_{stg} | Storage temperature range | | - 65 + 175 | °C |
| T_j | Maximum operating junction temperature | | + 175 | °C |

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THERMAL RESISTANCES

| Symbol | Parameter | | Value | Unit |
|----------------------|------------------|--|-------|------|
| R _{th(j-c)} | Junction to case | TO-220AC / D ² PAK / I ² PAK | 2.2 | °C/W |
| | | TO-220FPAC | 4.6 | |

STATIC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Tests conditions | | Min. | Typ. | Max. | Unit |
|----------------|-------------------------|-----------------------|------------------------|------|------|------|------|
| I _R | Reverse leakage current | V _R = 600V | T _j = 25°C | | | 30 | μA |
| | | | T _j = 125°C | | 35 | 400 | |
| V _F | Forward voltage drop | I _F = 8 A | T _j = 25°C | | | 2.9 | V |
| | | | T _j = 125°C | | 1.4 | 1.8 | |

To evaluate the maximum conduction losses use the following equation :
 $P = 1.16 \times I_{F(AV)} + 0.08 I_{F(RMS)}^2$

DYNAMIC ELECTRICAL CHARACTERISTICS

| Symbol | Tests conditions | | Min. | Typ. | Max. | Unit |
|-----------------|--|------------------------|------|------|------|------|
| trr | I _F = 0.5 A I _{rr} = 0.25 A I _R = 1A | T _j = 25°C | | | 25 | ns |
| | I _F = 1 A dI _F /dt = - 50 A/μs V _R = 30V | | | | 45 | |
| I _{RM} | V _R = 400 V I _F = 8A dI _F /dt = - 200A/μs | T _j = 125°C | | 5.5 | 7.2 | A |
| S factor | | | | 0.3 | | |
| Q _{rr} | | | | 150 | | |
| t _{fr} | I _F = 8 A dI _F /dt = 64 A/μs | T _j = 25°C | | | 150 | ns |
| V _{FP} | V _{FR} = 1.1 x V _{Fmax} | | | | 5 | V |

Fig. 1: Conduction losses versus average current.

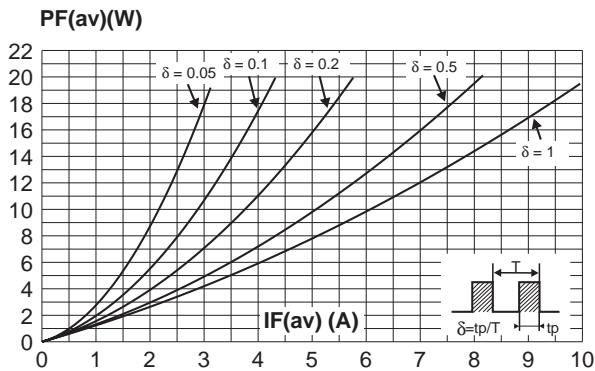


Fig. 2: Forward voltage drop versus forward current.

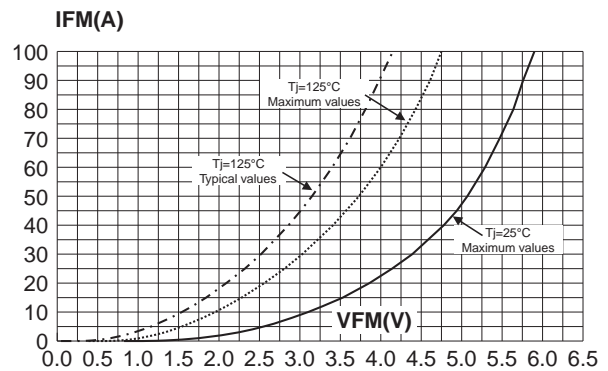


Fig. 3-1: Relative variation of thermal impedance junction to case versus pulse duration (TO-220AC, I²PAK, D²PAK).

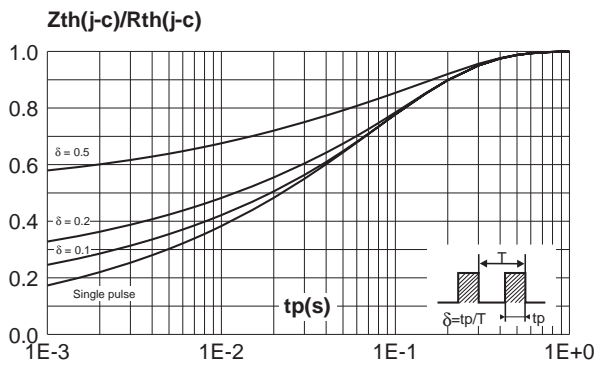


Fig. 3-2: Relative variation of thermal impedance junction to case versus pulse duration (TO-220FPAC).

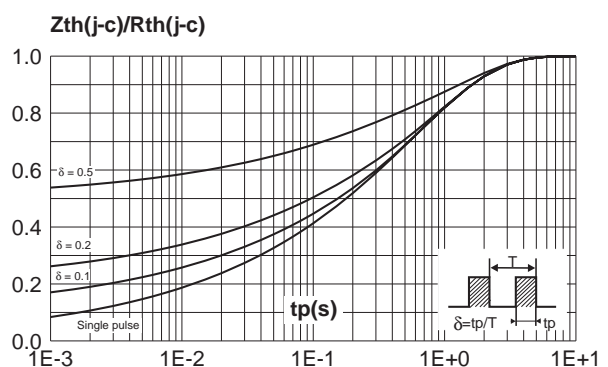


Fig. 4: Peak reverse recovery current versus dI_F/dt (90% confidence).

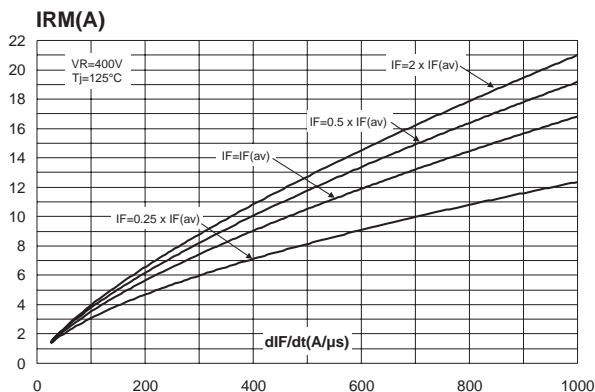


Fig. 5: Reverse recovery time versus dI_F/dt (90% confidence).

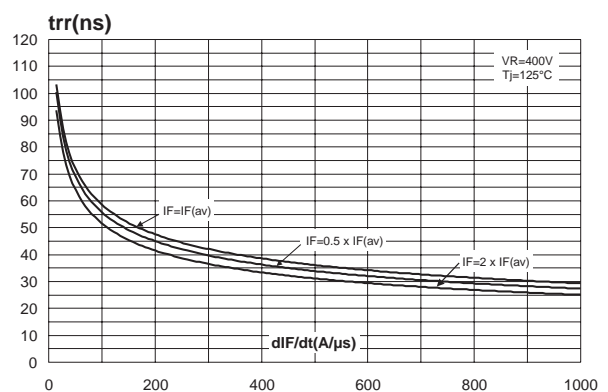


Fig. 6: Reverse recovery charges versus dI_F/dt (90% confidence).

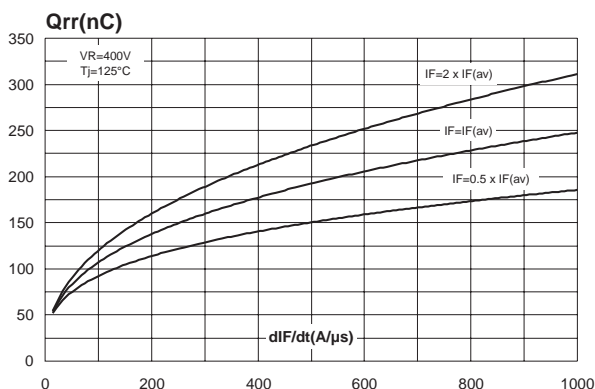


Fig. 7: Softness factor (t_b/t_a) versus dI_F/dt (typical values).

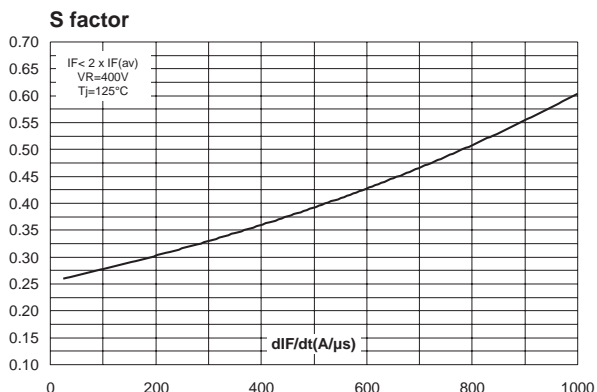


Fig. 8: Relative variation of dynamic parameters versus junction temperature (Reference: $T_j=125^\circ\text{C}$).

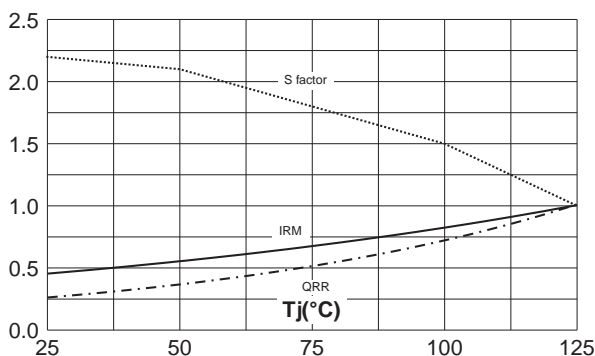


Fig. 9: Transient peak forward voltage versus dI_F/dt (90% confidence).

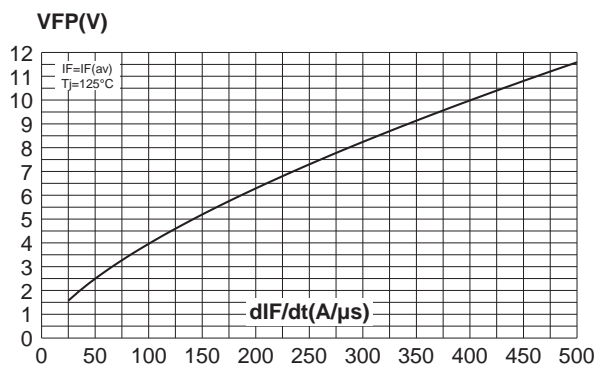


Fig. 10: Forward recovery time versus dI_F/dt (90% confidence).

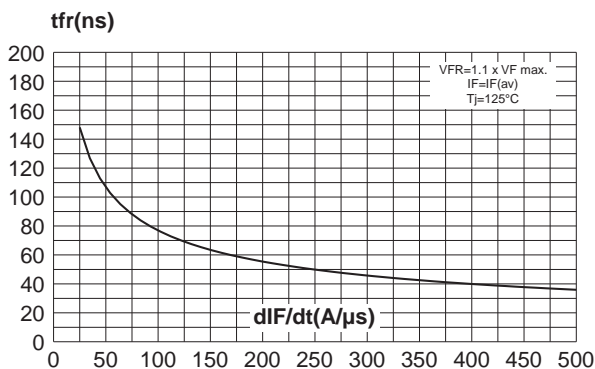
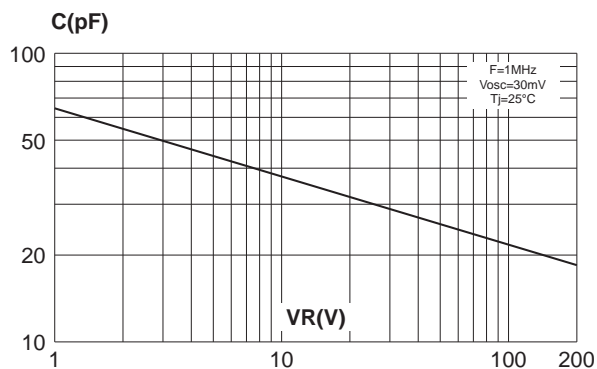
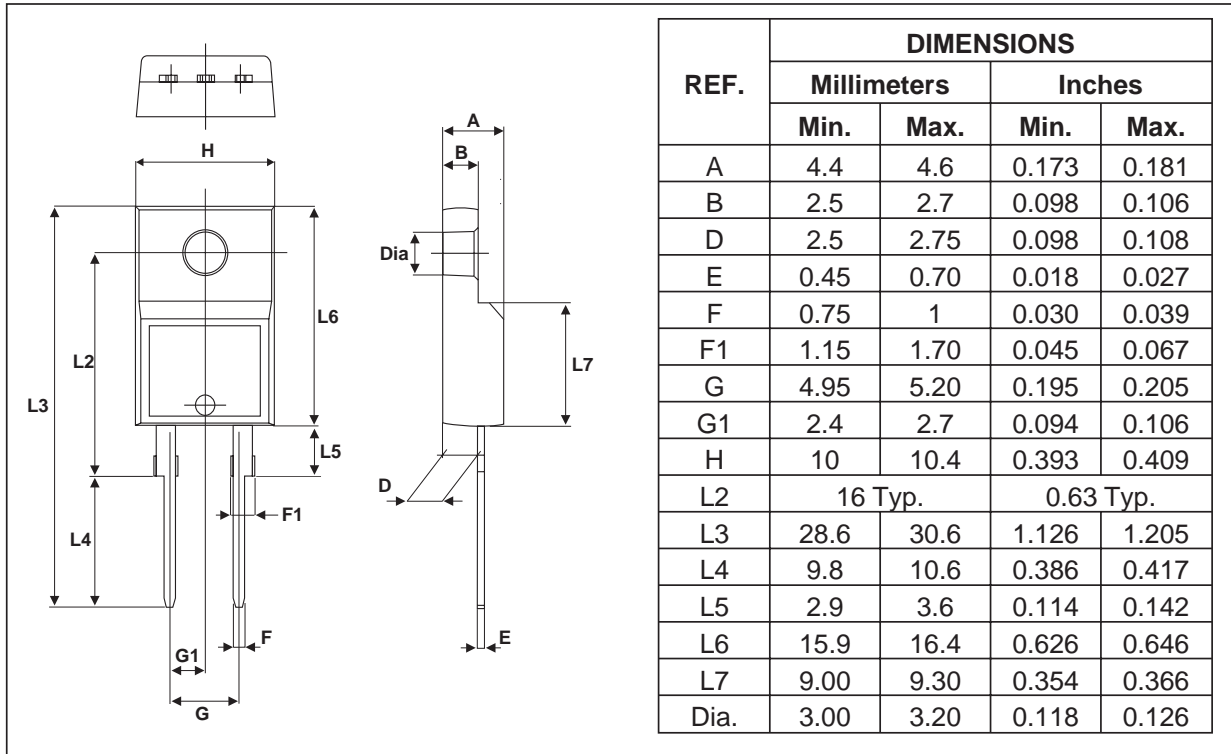


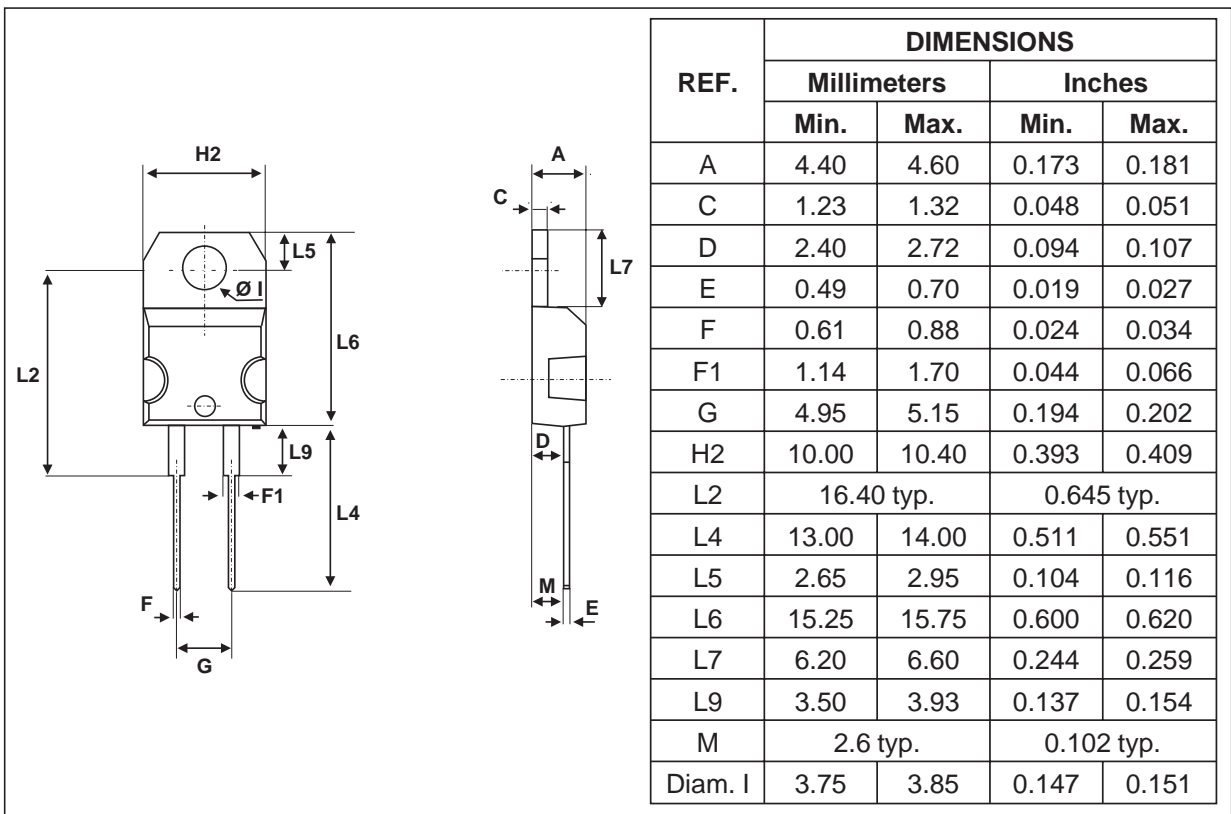
Fig. 11: Junction capacitance versus reverse voltage applied (typical values).



PACKAGE MECHANICAL DATA
TO-220FPAC

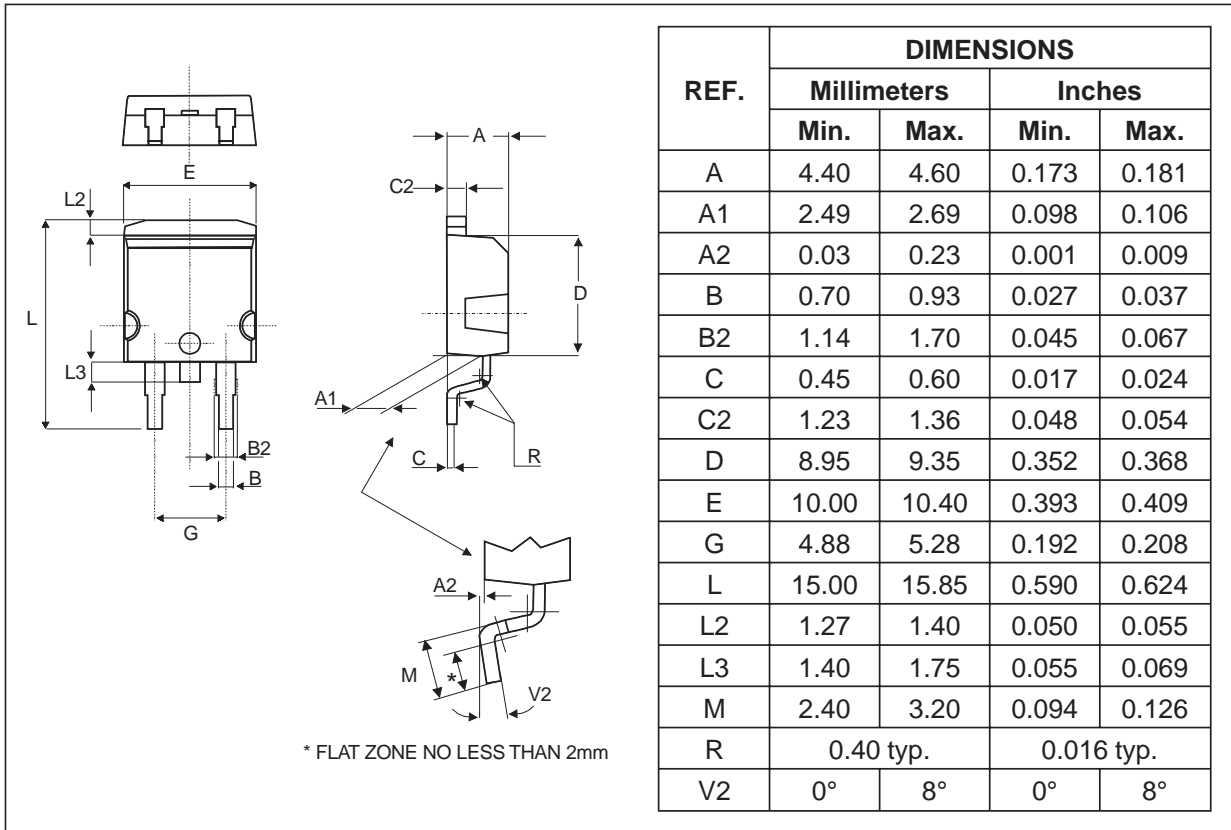


PACKAGE MECHANICAL DATA
TO-220AC

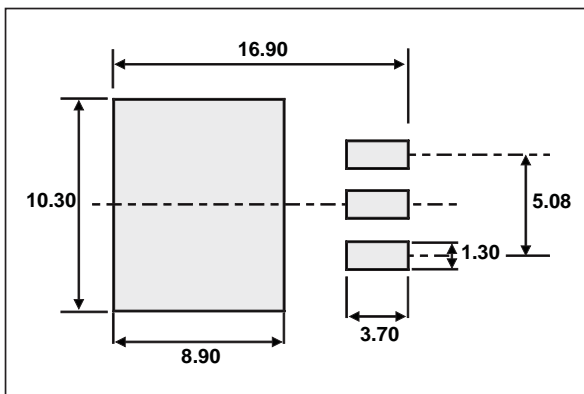


PACKAGE MECHANICAL DATA

D²PAK



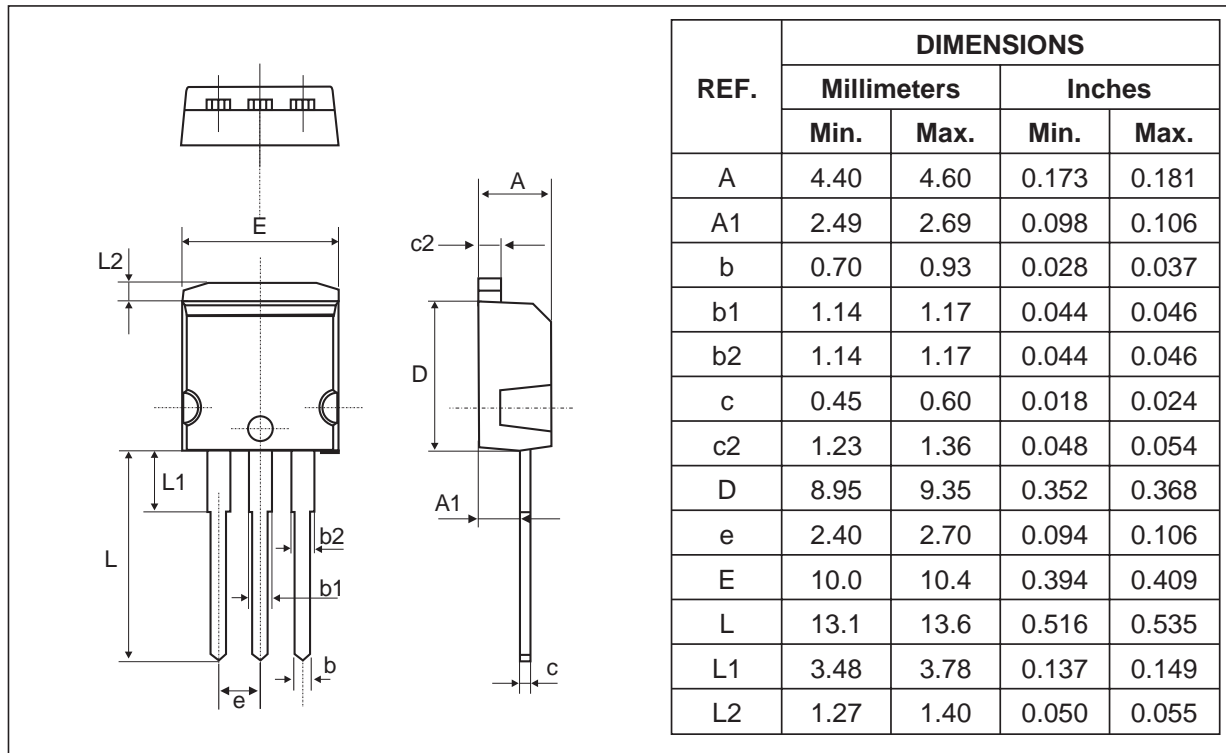
FOOTPRINT (in millimeters)



STTH8R06D/FP/G/R

PACKAGE MECHANICAL DATA

I²PAK



| Ordering code | Marking | Package | Weight | Base qty | Delivery mode |
|---------------|------------|--------------------|--------|----------|---------------|
| STTH8R06D | STTH8R06D | TO-220AC | 1.9 g | 50 | Tube |
| STTH8R06FP | STTH8R06FP | TO-220FPAC | 1.7 g | 50 | Tube |
| STTH8R06G | STTH8R06G | D ² PAK | 1.5 g | 50 | Tube |
| STTH8R06R | STTH8R06R | I ² PAK | 1.5 g | 50 | Tube |

- Cooling method: by conduction (C)
- Recommended torque value (TO-220AC): 0.55 Nm
- Maximum torque value (TO-220AC / TO-220FPAC): 0.7 Nm
- Epoxy meets UL 94,V0

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