

AUTOMATIC VOLTAGE SWITCH (SMPS < 300W)

CONTROLLER

- 50/60Hz FULL COMPATIBILITY
- INTEGRATED VOLTAGE REGULATOR
- TRIAC TRIGGERING BY PULSE TRAIN
- HIGH IMMUNITY TO AC DISTURBANCES (SPIKES, MISSING CYCLE)
- HIGH RELIABILITY ON LINE VOLTAGE DETECTION (PARASITIC FILTER ON SIGNAL INPUT)
- FAST DIGITAL START-UP TIME (< 2 LINE CYCLES)
- LOW POWER CONSUMPTION

TRIAC

- HIGH EFFICIENCY AND SAFETY SWITCHING
- UNINSULATED PACKAGE : AVS10CB/AVS100CB
- INSULATED PACKAGE (2500V_{RMS}) : AVS10CBI
- V_{DRM} = ±600V (AVS10CB), ±800V (AVS100CB)
- I_{T(RMS)} : 8A

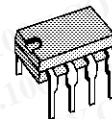
DESCRIPTION

The AVS20 (AVS200) kit is an automatic mains selector (120/230V AC) to be used in SMPS with input power < 300 W. It is composed of 2 devices :

- The **Controller** is optimized for low consumption and high security triggering of the triac. When connected to V_{SS}, the **mode** input activates an additional **option** "the **latched** option". If the main power drops from 230V to 120V, the triac control remains locked to the 230V mode and avoids any high voltage spike when the voltage is restored to 230V.

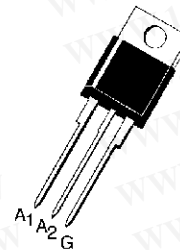
When connected to V_{DD}, the **mode** input desactivates this **option** "this is the **follower** option".

- The TRIAC is specially designed for this application. An optimization between sensitivity and dynamic parameters of the triac gate highly reduces the losses of supply resistor and allows excellent immunity against line disturbances.



P
DIP8
(Plastic Package)

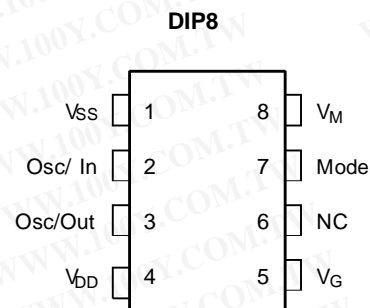
ORDER CODE : AVS2ACP08



B
TO220AB
(Plastic Package)

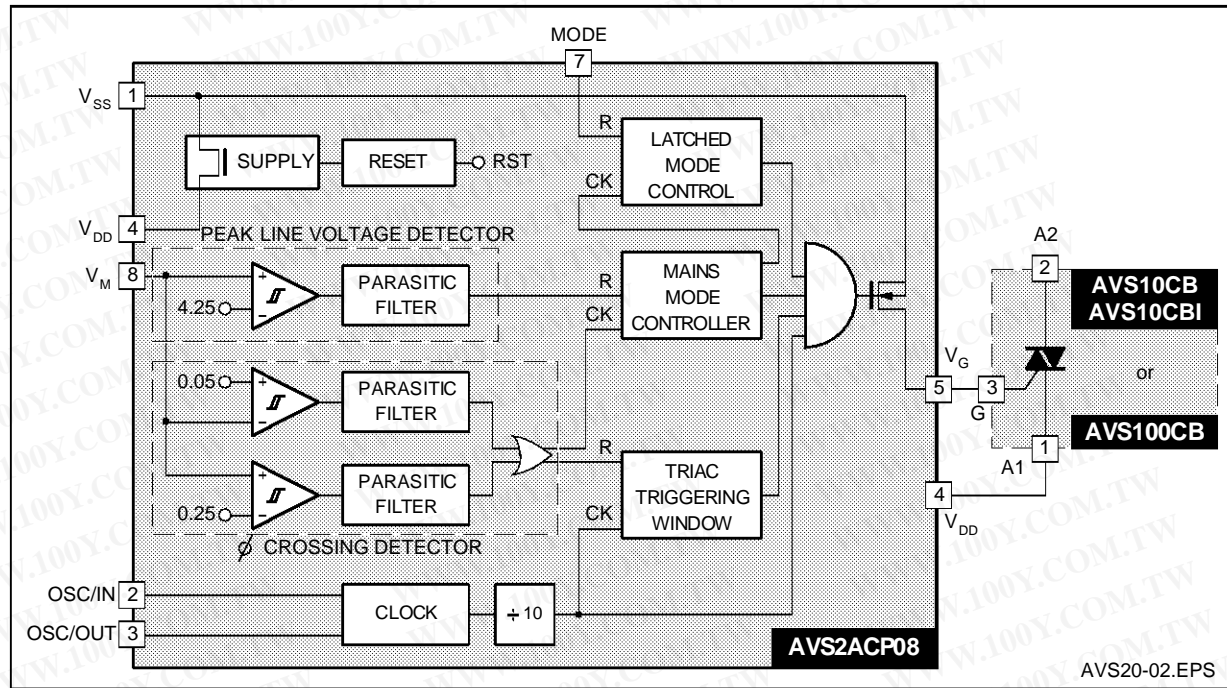
ORDER CODES : AVS10CB-AVS10CBI-AVS100CB

PIN CONNECTIONS



AVS20-01.EPS

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS
 CONTROLLER AVS2ACP08

| Symbol | Parameter | Min. | Max. | Unit |
|---------------------------------|--------------------------------|-----------------------|-------|------|
| V _{SS} | Supply voltage | - 12 | 0.5 | V |
| V _I / V _O | I / O voltage | V _{SS} - 0.5 | 0.5 | V |
| I _I / I _O | I / O current | - 40 | + 40 | mA |
| T _{stg} | Storage Temperature | - 60 | + 150 | °C |
| T _{oper} | Operating Temperature code "C" | 0 | + 70 | °C |

TRIAC AVS10CB / AVS10CBI / AVS100CB T_j = +25°C (unless otherwise specified)

| Symbol | Parameter | Value | Unit |
|---------------------|--|-----------|------------------|
| V _{DRM} | Repetitive peak off-state voltage (2) | AVS10 | ±600 |
| | | AVS100 | ±800 |
| I _{T(RMS)} | RMS on-state current (360° conduction angle) T _C = 80°C, AVS10CB/AVS100CB T _C = 70°C, AVS10CBI | 8 | A |
| | | 8 | A |
| I _{TSM} | Non repetitive surge peak on-state current (T _j initial = 25°C) t = 8.3ms t = 10ms | 85 80 | A A |
| I ² t | I ² t value (t = 10ms) | 32 | A ² s |
| di/dt | Critical rate of rise of on-state current (1) Repetitive f = 50Hz Non Repetitive | 20 100 | A/µs A/µs |
| dv/dt (3) | Linear slope up to 400V (Gate open) (T _j = 70°C) AVS10 AVS100 | 75 150 | V/µs V/µs |
| T _{stg} | Storage Temperature | -40, +150 | °C |
| T _j | Operating Junction Temperature | 0, +110 | °C |

(1) Gate supply : I_G = 100mA - di/dt = 1A/µs
 (2) T_j = 110°C
 (3) For either polarity of electrode A₂ voltage with reference to electrode A₁

THERMAL RESISTANCES

TRIAC AVS10CB / AVS10CBI / AVS100CB

| Symbol | Parameter | Value | Unit |
|------------------|--|--------------------|---------------|
| $R_{th(j-a)}$ | Junction-to-ambient | 60 | $^{\circ}C/W$ |
| $R_{th(j-c)}$ DC | Junction-to-case for DC | AVS10CB / AVS100CB | 3.5 |
| | | AVS10CBI | 4.4 |
| $R_{th(j-c)}$ AC | Junction-to-case for 360° conduction angle (f = 50Hz) | AVS10CB / AVS100CB | 2.6 |
| | | AVS10CBI | 3.3 |
| | | | |

AVS20-03.TBL

DC GENERAL ELECTRICAL CHARACTERISTICS

TRIAC AVS10CB / AVS10CBI / AVS100CB

| Symbol | Parameter | Min. | Max. | Unit |
|--------------|---|----------------------------------|------|---------|
| V_{GD} | $V_D = V_{DRM}$ $R_L = 3.3k\Omega$ Pulse duration > 20 μs ($T_j = 110^{\circ}C$) | 0.2 | | V |
| $V_{TM}(1)$ | $I_{TM} = 11A$ ($t_p = 10ms$, $T_j = 25^{\circ}C$) | | 1.75 | V |
| $I_{DRM}(1)$ | V_{DRM} rated Gate open | $T_j = 25^{\circ}C$ AVS10/AVS100 | 10 | μA |
| | | $T_j = 110^{\circ}C$ AVS10 | 500 | μA |
| | | $T_j = 700^{\circ}C$ AVS100 | 500 | μA |
| | | | | |

AVS20-04.TBL

CONTROLLER AVS2ACP08 $T_{oper} = 25^{\circ}C$ (unless otherwise specified)

| Symbol | Parameter | Min. | Typ. | Max. | Unit |
|--------|-----------|------|------|------|------|
|--------|-----------|------|------|------|------|

MAIN CHARACTERISTICS

| | | | | | |
|---|--|----------|-----------|-------------|---------------|
| V_{SS} (pin 1) (Vreg) | Shunt Regulator Voltage | - 10 | - 9 | - 8 | V |
| I_{SS} (pin 1) (Vreg) (@ $V_{SS} = -9V$) | Supply Current | 0.4 | | 30 | mA |
| | Quiescent Current | | 0.6 | 0.7 | mA |
| F (pin 3) (@ $R = 91k\Omega$) ($C = 100pF$) | Oscillator Frequency | 42 | 44 | 46 | kHz |
| V_{PWRON} (2) | Power-on-reset Threshold | | 0.89 Vreg | | |
| V_{PWROFF} (2) | Power-off-reset Threshold | | 4.6 | | V |
| Mode (pin 7) | V_{IL} (2) | 0.7 Vreg | | 0.3 Vreg | |
| | V_{IH} (2) | | | | |
| V_G (pin 5) | V_{OL} ($I_{VG} = 25mA$) Leakage Current ($V_G = V_{DD}$) | | | 650 + 10 | mV μA |

PEAK LINE VOLTAGE DETECTOR

| | | | | | |
|---------------------|---|------|------|------|-------------|
| V_{SWON} (pin 8) | Low Threshold of Trip Point (switching-on of triac triggering) (3) | 3.89 | 4.05 | 4.22 | V |
| V_{SWOFF} (pin 8) | High Threshold of Trip Point (switching-off of triac triggering) (3) | 4.08 | 4.25 | 4.42 | V |
| t_{ON} (pin 5) | Triac Turn-on Delay Time ($V_{AC} = 120V$) | 1 | | 2 | Line cycles |

ZERO VOLTAGE CROSSING DETECTOR

| | | | | | |
|--------------------|---|--|-----|--|----|
| V_{0CRPH} (pin8) | High Threshold on Positive AC Side (3) | | 250 | | mV |
| V_{0CRPL} (pin8) | Low Threshold on Positive AC Side (3) (4) | | 200 | | mV |
| V_{0CRNH} (pin8) | High Threshold on Negative AC Side (3) | | 100 | | mV |
| V_{0CRNL} (pin8) | Low Threshold on Negative AC Side (3) (4) | | 60 | | mV |

AVS20-05.TBL

NOTES :

- (1) : For either polarity of electrode A₂ voltage with reference to electrode A₁.
 (2) : Voltage referred to V_{DD} .
 (3) : Voltage referred to V_{SS} .

(4) : These values give a typical noise immunity on the zero-crossing detection of $100mV \times \frac{1018}{18} = 5.65V$ on the mains supply.

AVS20 - AVS200

Figure 1: Maximum RMS power dissipation versus RMS on-state current ($f=60\text{Hz}$)
(Curves are cut-off $(di/dt)_c$ limitation)

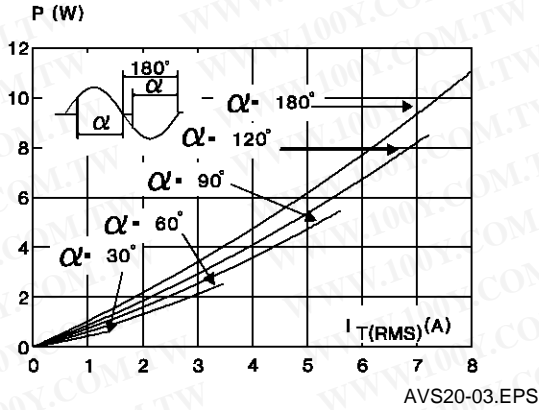


Figure 2a: Correlation between maximum mean power dissipation and maximum allowable temperatures (T_A and T_C) for different thermal resistances heatsink + contact (AVS10CB/AVS100CB)

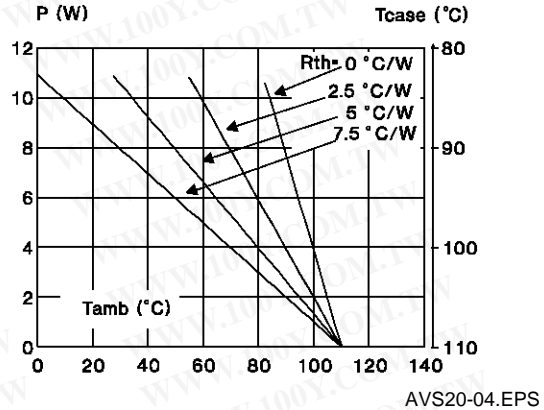


Figure 2b: Correlation between maximum mean power dissipation and maximum allowable temperatures (T_A and T_C) for different thermal resistances heatsink + contact (AVS10CBI)

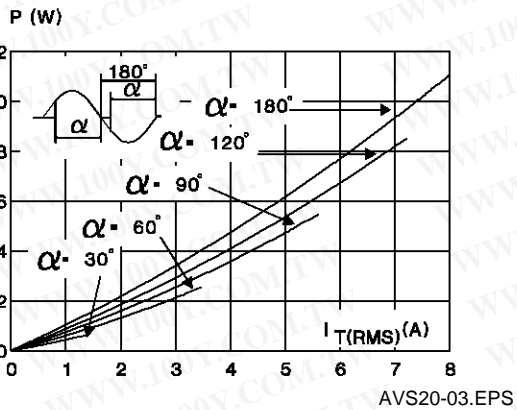


Figure 3: Non-repetitive surge peak on-state current for a sinusoidal pulse with width $: t \leq 10\text{ms}$, and corresponding value of I^2t .

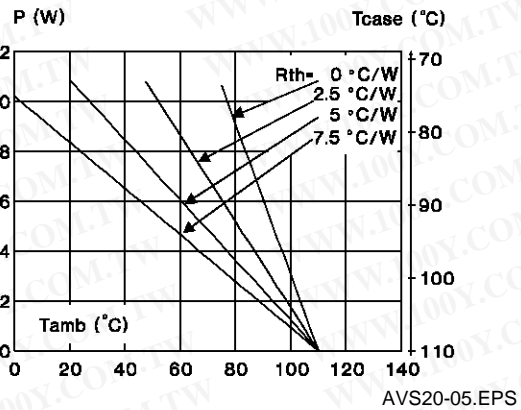
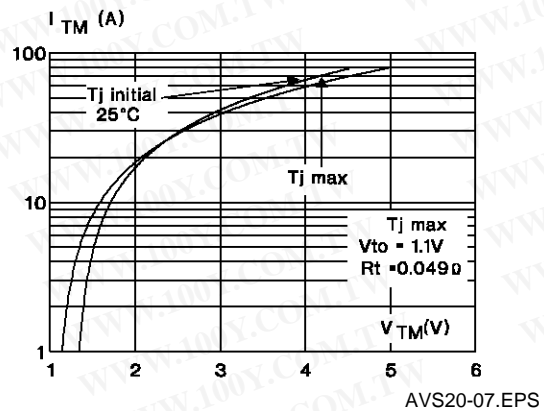
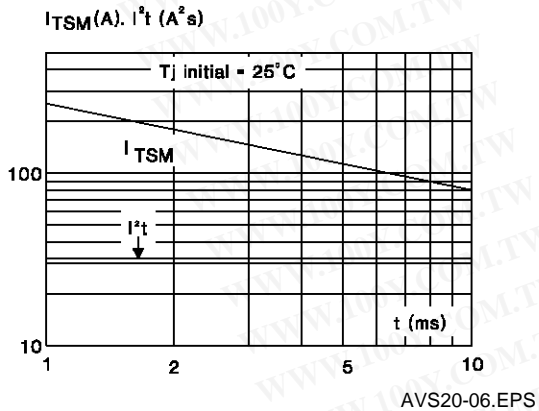
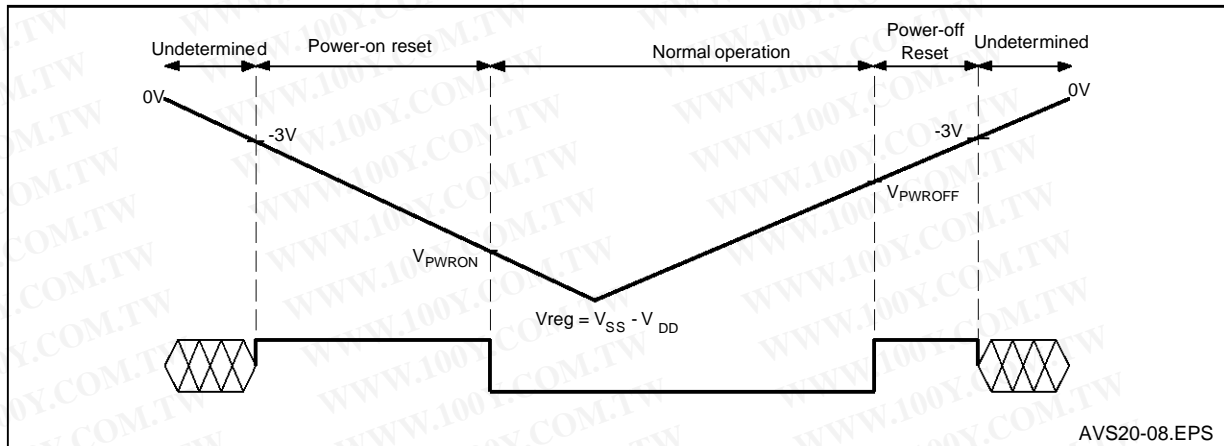


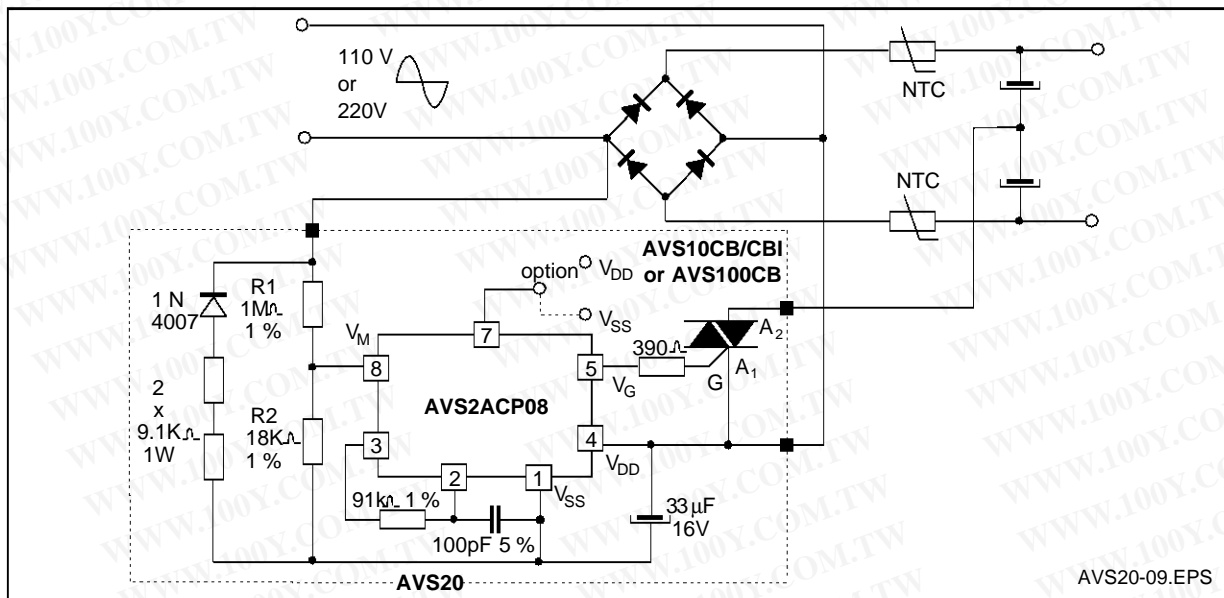
Figure 4: On-state characteristics (maximum values).



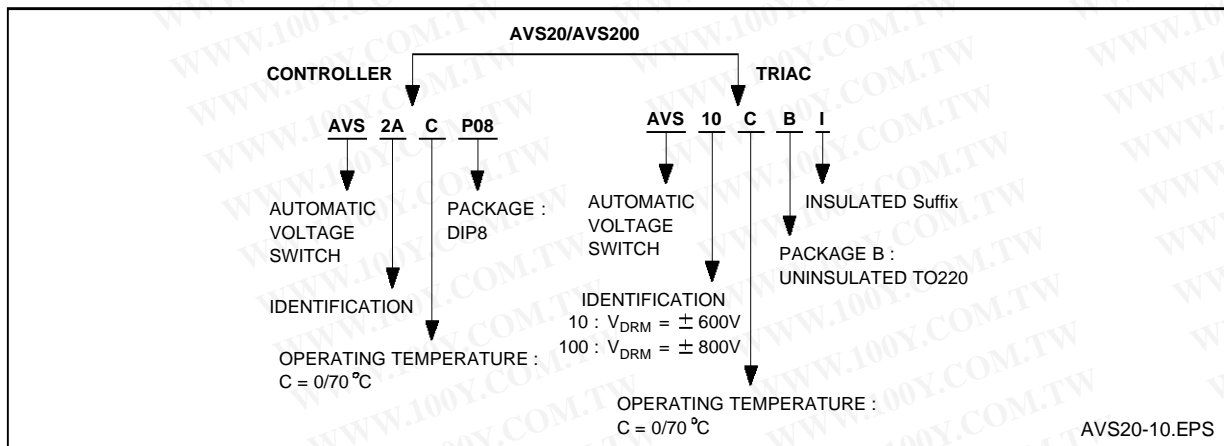
POWER-ON AND POWER-OFF RESET BEHAVIOUR



TYPICAL APPLICATION DIAGRAM



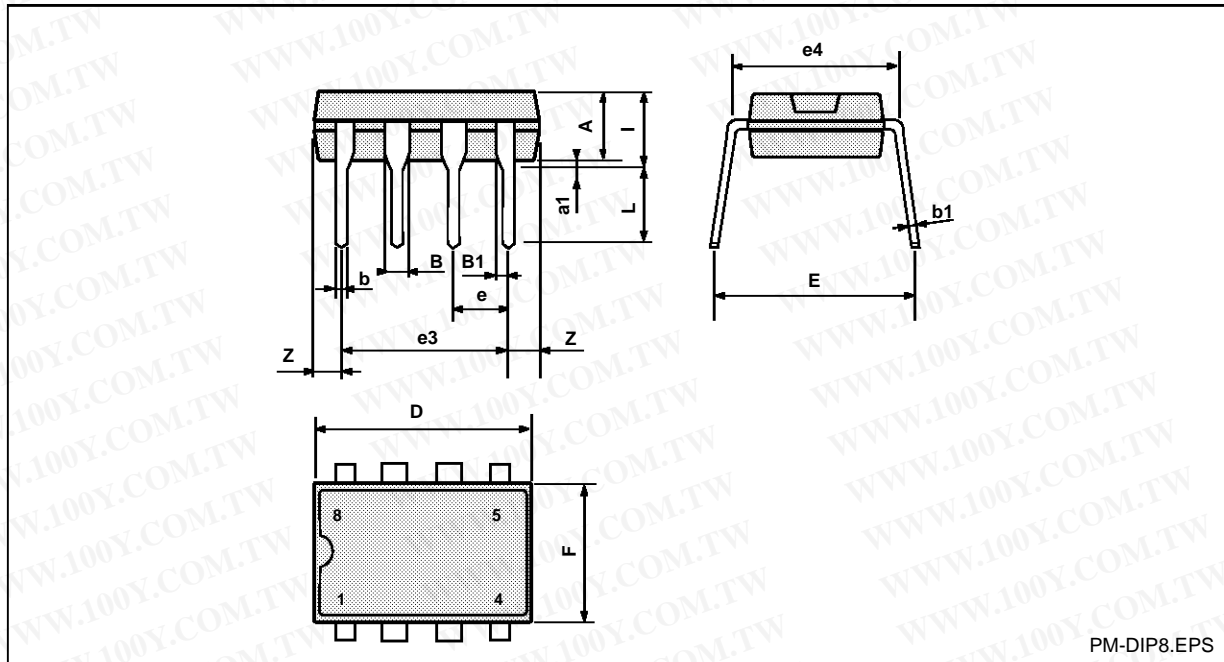
ORDERING INFORMATION



AVS20 - AVS200

PACKAGE MECHANICAL DATA

CONTROLLER
 8 PINS - PLASTIC DIP



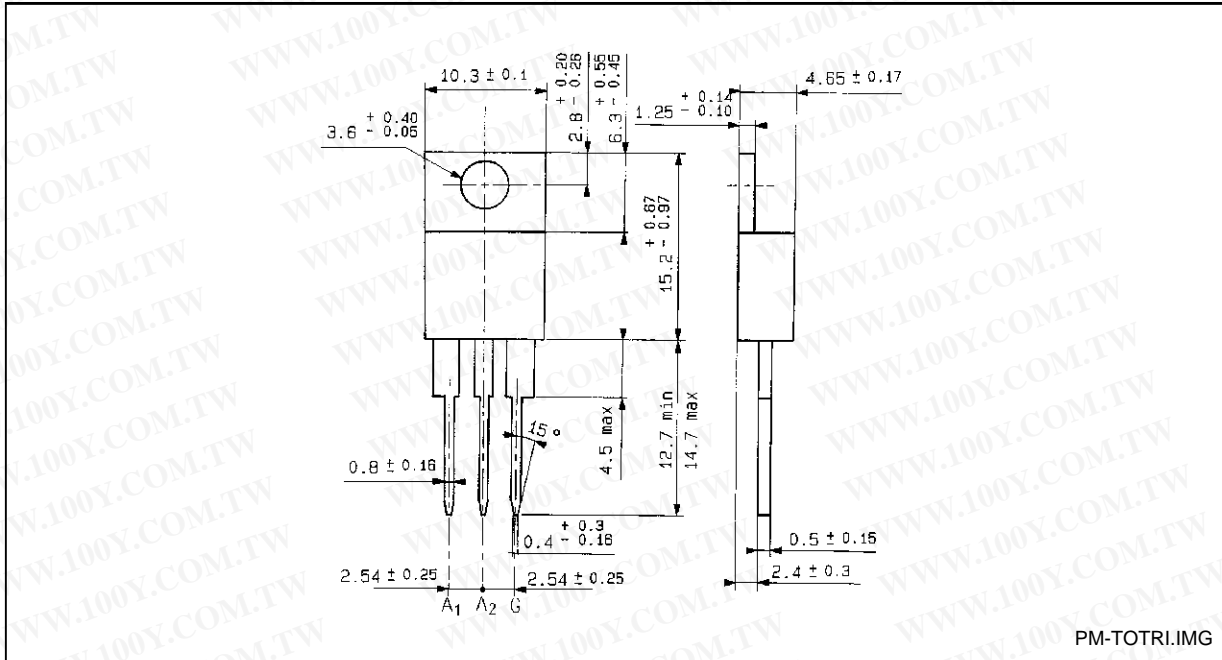
PM-DIP8.EPS

| Dimensions | Millimeters | | | Inches | | |
|------------|-------------|------|-------|--------|-------|-------|
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | | 3.32 | | | 0.131 | |
| a1 | 0.51 | | | 0.020 | | |
| B | 1.15 | | 1.65 | 0.045 | | 0.065 |
| b | 0.356 | | 0.55 | 0.014 | | 0.022 |
| b1 | 0.204 | | 0.304 | 0.008 | | 0.012 |
| D | | | 10.92 | | | 0.430 |
| E | 7.95 | | 9.75 | 0.313 | | 0.384 |
| e | | 2.54 | | | 0.100 | |
| e3 | | 7.62 | | | 0.300 | |
| e4 | | 7.62 | | | 0.300 | |
| F | | | 6.6 | | | 0.260 |
| i | | | 5.08 | | | 0.200 |
| L | 3.18 | | 3.81 | 0.125 | | 0.150 |
| Z | | | 1.52 | | | 0.060 |

DIP8.TBL

PACKAGE MECHANICAL DATA

TRIAC
3 PINS - PLASTIC TO220AB



Cooling method : by conduction (method C)

Weight : 2 g

勝特力材料 886-3-5753170
 勝特力电子(上海) 86-21-54151736
 勝特力电子(深圳) 86-755-83298787
[Http://www.100y.com.tw](http://www.100y.com.tw)

AVS20 - AVS200

NOTES:

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