

■ General Description

The ATPA02G is a power sequence controller for AMD K8 processor. This part can mainly control the power supply relationships during power up, power down, entry and exit of any power management state in order to avoid damage to the device and ensure proper operation of the device.

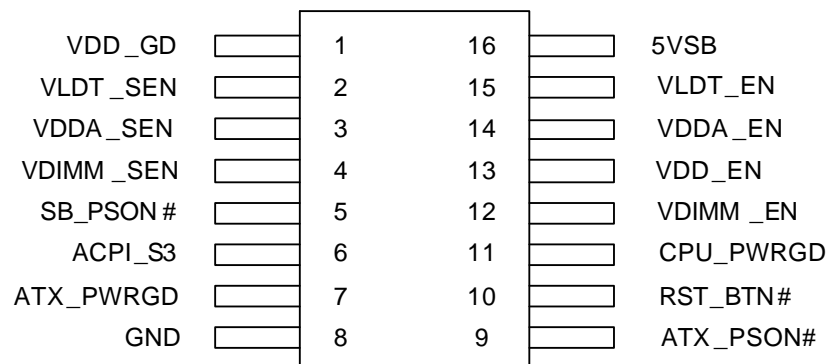
■ Features

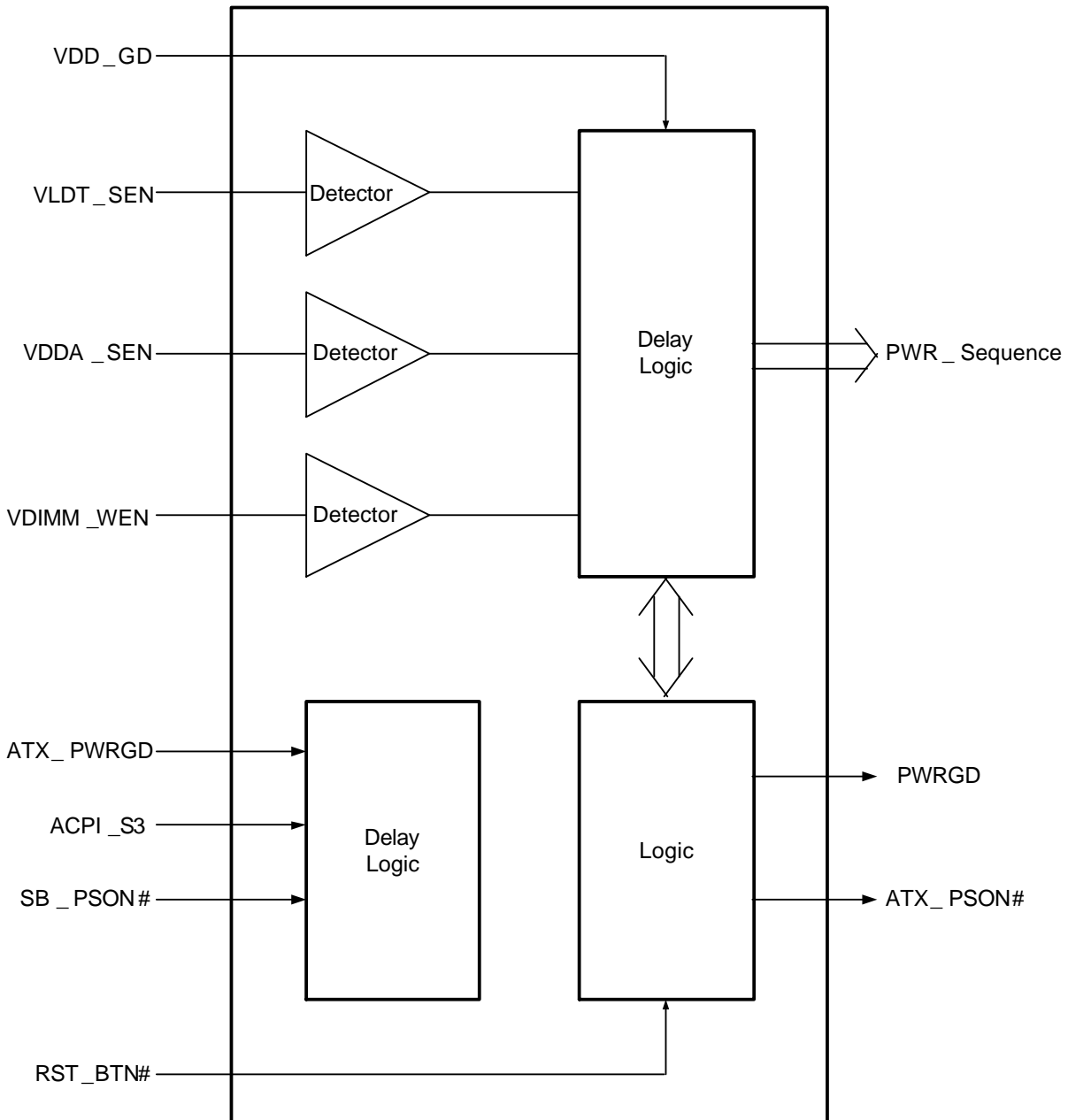
- Provides a Complete Power Sequence Controller
- Supports DDR ACPI-STR Functions
- Under-Voltage Fault Monitor
- Package: SOP-16
- Green Package
- All AME's Lead Free Products Meet RoHS Standards

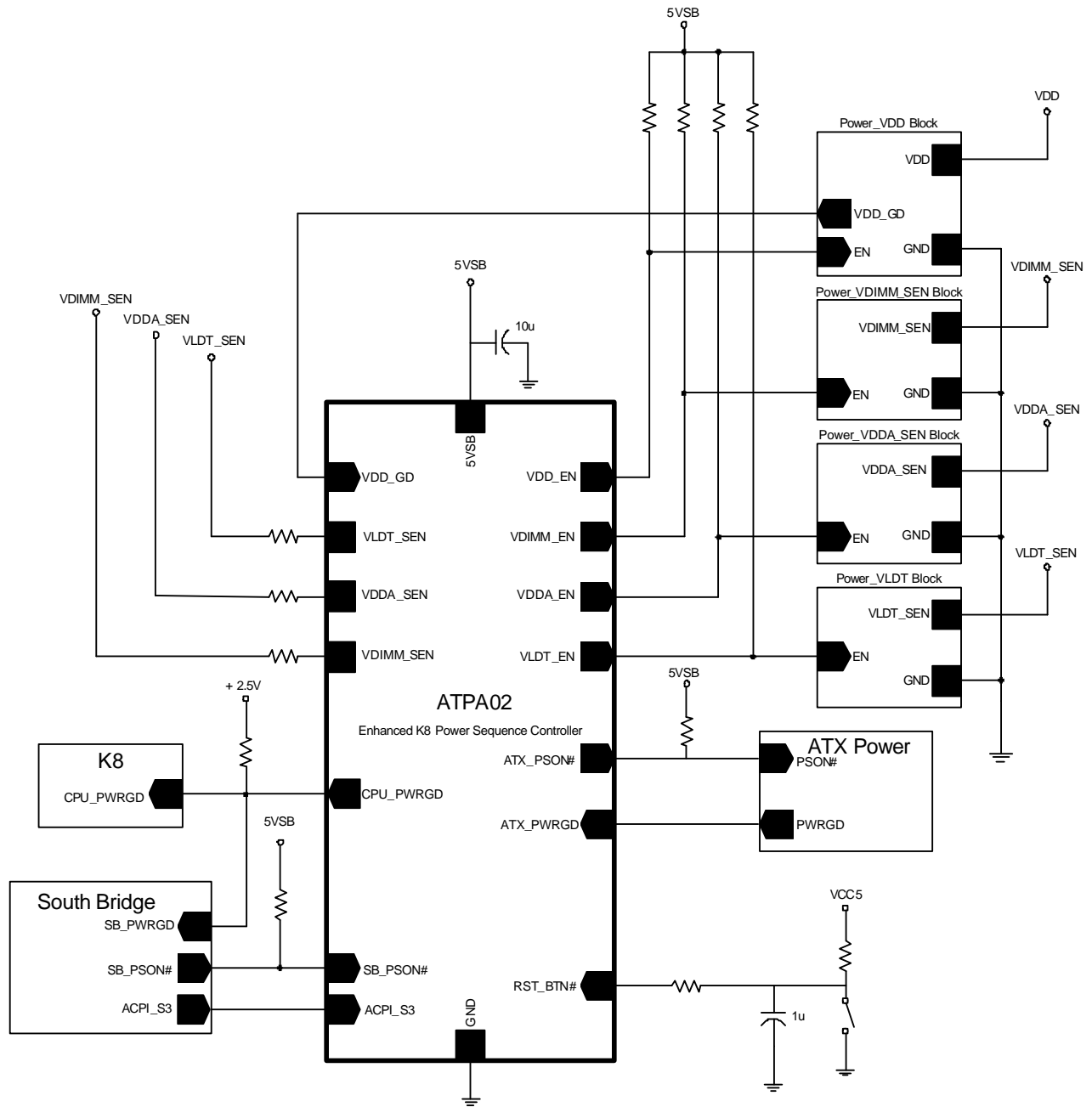
■ Application

- Motherboard
- Desktop system

■ Pin Configuration



■ Function Block Diagram


■ Application Circuit


■ Pin Description

| I/O Type | Function |
|------------------|-----------------------------------|
| IN _t | TTL level input |
| IN _a | Analog input |
| OD ₇₀ | Open-drain with 70mA sink current |

| Pin No. | Pin Name | I/O Type | Function |
|---------|-----------|------------------|---|
| 1 | VDD_GD | IN _t | Active-High of this signal indicates VDD voltage is valid. This signal is usually connected to the power-good output of the PWM for CPU core voltage |
| 2 | VLDT_SEN | IN _a | This pin is used to detect the ClawHammer VLDT (1.2V) power or power-good signal. |
| 3 | VDDA_SEN | IN _a | This pin is used to detect the ClawHammer VDDA (2.5V) power or power-good signal. |
| 4 | VDIMM_SEN | IN _a | This pin is used to detect the VDIMM (2.5V/1.8V) power or power-good signal. |
| 5 | SB_PSON# | IN _t | Active low. This signal is connected to the PSON# signal from the SB or Super I/O to control the on/off of ATX power supply. |
| 6 | ACPI_S3 | IN _t | Active high. This signal indicates that the system is in S3 state. |
| 7 | ATX_PWRGD | IN _t | Active-High of this signal indicates all of the voltage from the ATX power supply is valid. |
| 8 | GND | | Ground |
| 9 | ATX_PSON# | OD ₇₀ | Active low. This pin is used to control the on/off of ATX power supply. Active-Low of this signal will turn on the ATX power supply. This pin is open-drain output and should be pulled-up via a resistor to 5VSB externally. |
| 10 | RST_BTN# | IN _t | Active low. This function is panel reset button input with de-bounce circuit. |
| 11 | CPU_PWRGD | OD ₇₀ | Active high. This signal is connected to the Claw Hammer to indicate all system powers are valid. This pin is open-drain output and should be pulled-up externally via a resistor to 2.5V. |

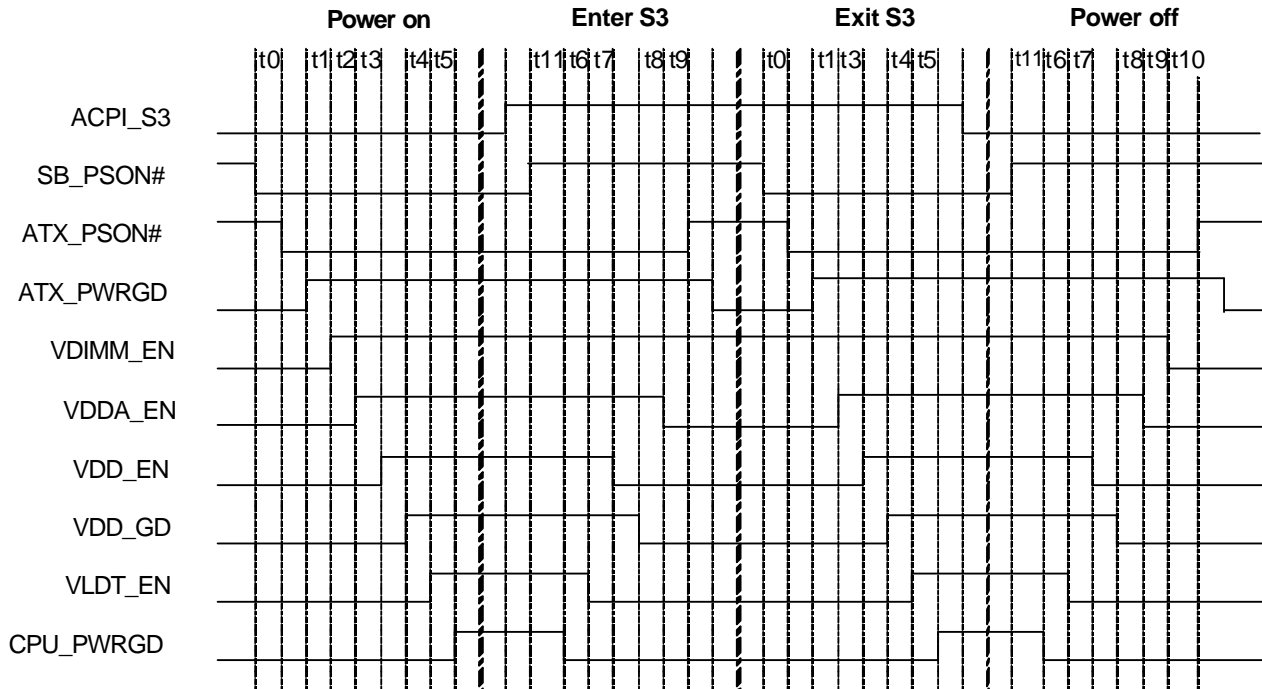
■ Pin Description (Contd.)

| Pin No. | Pin Name | I/O Type | Function |
|---------|----------|------------------|---|
| 12 | VDIMM_EN | OD ₇₀ | Active high. This pin is used to enable the function of the PWM for VDIMM voltage generation. |
| 13 | VDD_EN | OD ₇₀ | Active high. This pin is used to enable the function of the PWM for VDD voltage generation. |
| 14 | VDDA_EN | OD ₇₀ | Active high. This pin is used to enable the function of the VDDA power for ClawHammer. |
| 15 | VLDT_EN | OD ₇₀ | Active high. This pin is used to enable the function of the VLDT power for ClawHammer. |
| 16 | 5VSB | | Power |

■ Ordering Information

| Part Number | Marking | Package | Operating Ambient Temperature Range |
|-------------|-------------------------------|---------|-------------------------------------|
| ATPA02G | ATPA02G yyww AB xxxxxxx ## | SOP-16 | - 30°C to +85°C |

Note: yy:year (last two digits)
 ww:week
 xxxxxxx:wafer lot number
 ##:wafer number (It is a representative if a string of wafer are used.)

■ Time Sequence

■ AC Timing Parameter

| Item | Description | Timing | | |
|------|--|--------|---------|-------|
| | | Min | Typical | Max |
| t0 | SB_PSON# falling to ATX_PSON# falling | 1μs | 3μs | 6μs |
| t1 | ATX_PWRGD rising to VDIMM_EN rising | 40μs | 60μs | 80μs |
| t2 | VDIMM_SEN rising to VDDA_EN rising | 150ms | 190ms | 230ms |
| t3 | VDDA_SEN rising to VDD_EN rising | 3ms | 4ms | 5ms |
| t4 | VDD_GD rising to VLDT_EN rising | 3ms | 4ms | 5ms |
| t5 | VLDT_SEN rising to CPU_PWRGD rising | 3ms | 4ms | 5ms |
| t6 | CPU_PWRGD falling to VLDT_EN falling | 3ms | 4ms | 5ms |
| t7 | VLDT_SEN falling (0.85V) to VDD_EN falling | 7ms | 10ms | 13ms |
| t8 | VDD_GD falling to VDDA_EN falling | 315ms | 400ms | 485ms |
| t9 | VDDA_SEN falling to VDIMM_EN falling | 7ms | 10ms | 13ms |
| t10 | VDIMM_SEN falling to ATX_PSON# rising | 150ms | 190ms | 230ms |
| t11 | SB_PSON# rising to CPU_PWRGD falling | 3ms | 4ms | 5ms |

Note: All specified timing is simulated at pull_up resistor 9K, w/o power capacitance.

■ Absolute Maximum Ratings

| Parameter | Symbol | Rating | Unit |
|----------------|-----------------|--------------------------------|------|
| Power Supply | V _{CC} | -0.5V to +7V | V |
| Input Voltage | V _{CC} | -0.5V to V _{CC} +0.5V | V |
| Output Voltage | V _{CC} | -0.5V to V _{CC} +0.5V | V |

Note: Exceeding the absolute maximum rating may damage the device.

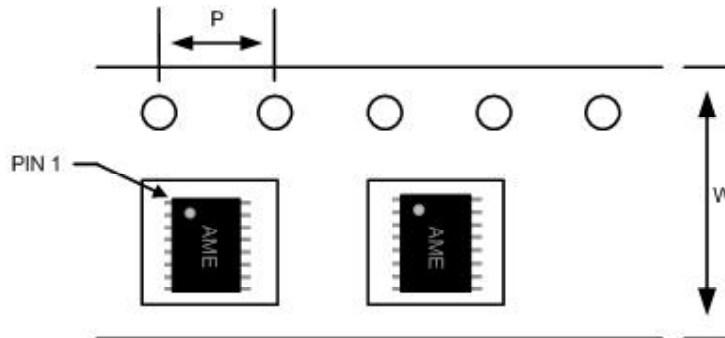
■ Recommended Operation Conditions

| Parameter | Symbol | Rating | Unit |
|---------------------------|------------------|--------------|------|
| Ambient Temperature Range | T _A | - 30 to +85 | °C |
| Storage Temperature Range | T _{STG} | - 55 to +125 | °C |

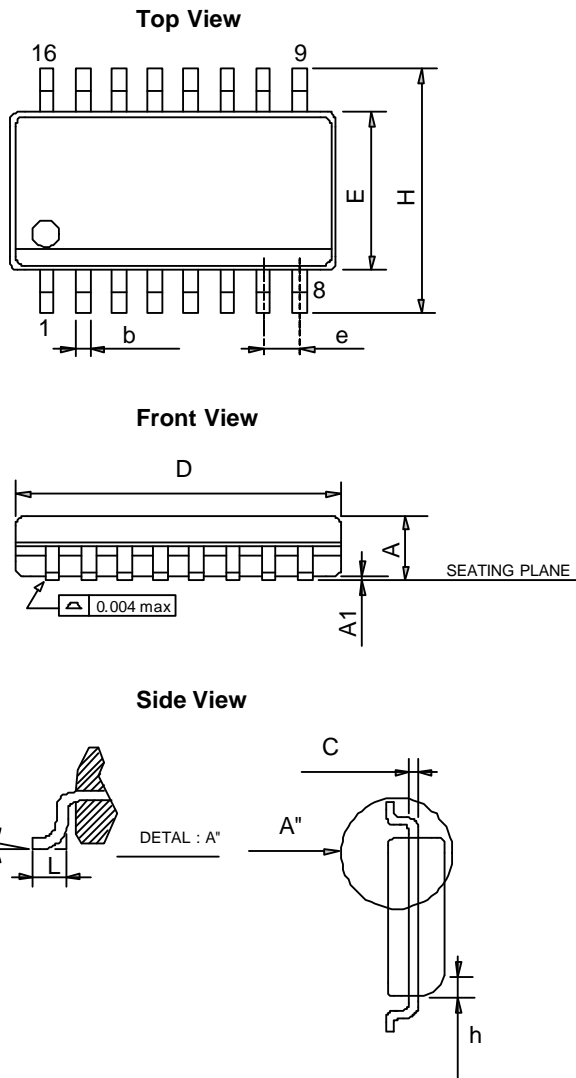
■ Electrical Specifications

V_{CC}=5V, T_A=25°C, unless otherwise specified.

| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|---------------------------------------|-------------------------|------------------------|-----|------|-----|------|
| Trigger point for VDIMM_SEN | V _{TRIG} | V _{CC} =5.25V | | 1.85 | | V |
| | | V _{CC} =5V | | 1.75 | | V |
| | | V _{CC} =4.75V | | 1.65 | | V |
| Trigger point for VDDA_SEN | V _{TRIG, VDDA} | V _{CC} =5.25V | | 2.3 | | V |
| | | V _{CC} =5V | | 2.2 | | V |
| | | V _{CC} =4.75V | | 2.1 | | V |
| Hysteresis for VDDA_SEN and VDIMM_SEN | V _{HYST} | | | 100 | | mV |
| Trigger point for VLDT_SEN | V _{TRIG, LDT} | V _{CC} =5.25V | | 0.88 | | V |
| | | V _{CC} =5V | | 0.85 | | V |
| | | V _{CC} =4.75V | | 0.83 | | V |
| Hysteresis for VLDT_SEN | V _{HYST, LDT} | | | 100 | | mV |
| Logic High Level | V _{IH} | | 2 | | | V |
| Logic Low Level | V _{IL} | | | | 0.8 | V |

■ Tape and Reel Dimension
SOP-16

Carrier Tape, Number of Components Per Reel and Reel Size

| Package | Carrier Width (W) | Pitch (P) | Part Per Full Reel | Reel Size |
|---------|-------------------|------------|--------------------|-----------|
| SOP-16 | 12.0±0.1 mm | 4.0±0.1 mm | 2500pcs | 330±1 mm |

■ Package Dimension
SOP-16


| SYMBOLS | MILLIMETERS | | INCHES | |
|---------|-------------|-------|----------|-------|
| | MIN | MAX | MIN | MAX |
| A | 1.35 | 1.75 | 0.053 | 0.069 |
| A1 | 0.10 | 0.25 | 0.004 | 0.010 |
| b | 0.40TYP | | 0.016TYP | |
| C | 0.20TYP | | 0.008TYP | |
| e | 1.27TYP | | 0.050TYP | |
| E | 3.81 | 4.00 | 0.150 | 0.157 |
| D | 9.80 | 10.00 | 0.386 | 0.394 |
| h | 0.38TYP | | 0.015TYP | |
| H | 5.80 | 6.20 | 0.228 | 0.244 |
| L | 0.41 | 1.27 | 0.016 | 0.050 |
| q | 0° | 8° | 0° | 8° |



www.ame.com.tw
E-Mail: sales@ame.com.tw

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Corporate Headquarter

AME, Inc.

2F, 302 Rui-Guang Road, Nei-Hu District

Taipei 114, Taiwan.

Tel : 886 2 2627-8687

Fax: 886 2 2659-2989