

**1A Snubber Damping Rectifier**

# QJAF

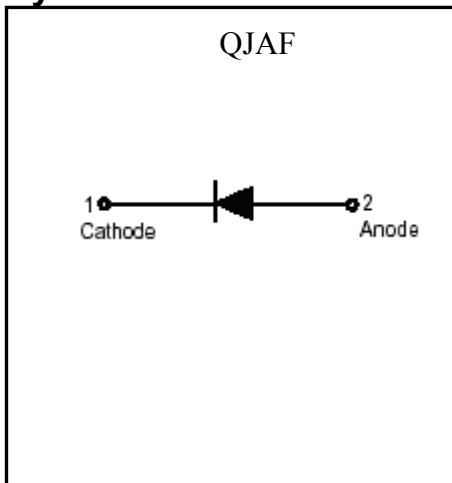
**Features**

- High current capability
- Smoothly soft reverse recovery time (trr)
- Low profile surface mounted package in order to minimize board space
- Pb-free lead plating and halogen-free package

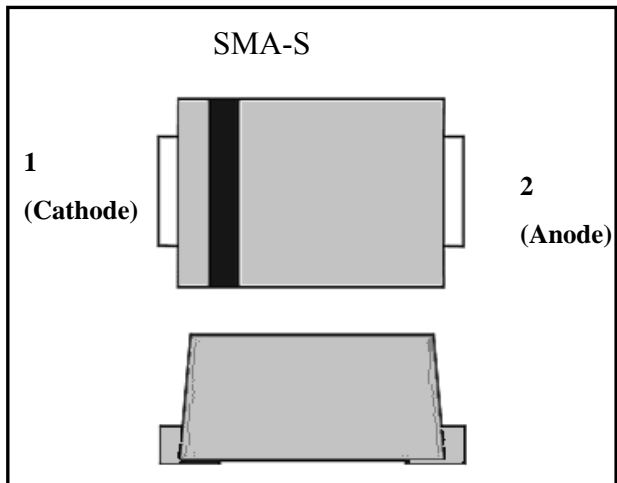
**Mechanical data**

- Case : Molded plastic, SMA-S/JEDEC DO-214AC
- Epoxy : UL94-V0 rated flame retardant
- Terminals : Plated terminals, solderable per MIL-STD-202 method 208
- Polarity : Indicated by cathode band
- Mounting position : Any
- Weight: 0.057 gram, 0.0017 ounce

**Symbol**

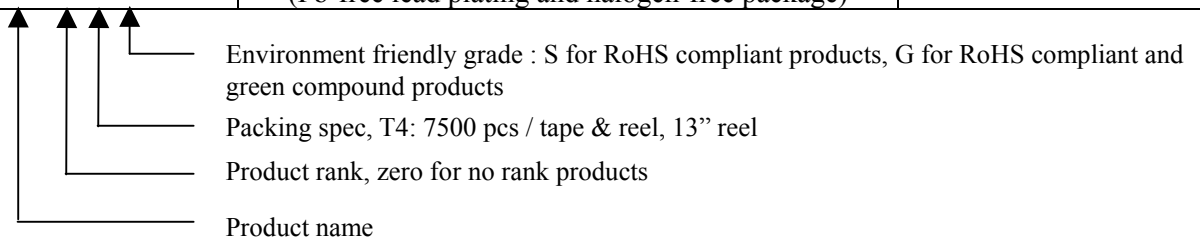


**Outline**



**Ordering Information**

| Device       | Package  | Shipping               |
|--------------|--|------------------------|
| QJAF-XX-T4-G | SMA-S<br>(Pb-free lead plating and halogen-free package) | 7500 pcs / tape & reel |





**Absolute Maximum Ratings** ( $T_A=25^{\circ}\text{C}$ , unless otherwise noted)

| Parameters                           | Conditions  | Symbol      | Value    |     |     | Units              |
|--------------------------------------|---|-------------|----------|-----|-----|--------------------|
|                                      |   |             | 62       | 65  | 70  |                    |
| Repetitive peak reverse voltage      |   | $V_{RRM}$   | 620      | 650 | 700 | V                  |
| RMS voltage                          |   | $V_{RMS}$   | 434      | 455 | 490 | V                  |
| Continuous reverse voltage           |   | $V_R$       | 620      | 650 | 700 | V                  |
| Forward rectified current            | Single phase half wave,<br>60Hz @ $T_J=25^{\circ}\text{C}$                  | $I_{F(AV)}$ | 1        |     |     | A                  |
| Repetitive Peak Forward Current      | Single phase half wave,<br>60Hz @ $T_J=25^{\circ}\text{C}$                  | $I_{FRM}$   | 1.57     |     |     | A                  |
| Forward surge current                | 8.3ms single half sine-wave<br>superimposed on rated load<br>(JEDEC method) | $I_{FSM}$   | 10       |     |     | A                  |
|                                      | $t_p \leq 1\mu\text{s}$   |             | 20       |     |     |                    |
| Maximum reverse recovery time        | $I_F=1\text{A}$ , $dI_F/dt=100\text{A}/\mu\text{s}$                         | $t_{rr}$    | 0.5      |     |     | $\mu\text{s}$      |
| Power Dissipation                    | $T_A=25^{\circ}\text{C}$ (Note )  | $P_D$       | 1.3      |     |     | W                  |
|                                      | $T_A=70^{\circ}\text{C}$ (Note )  |             | 0.83     |     |     |                    |
|                                      | $T_C=25^{\circ}\text{C}$  |             | 6.2      |     |     |                    |
|                                      | $T_C=100^{\circ}\text{C}$   |             | 2.5      |     |     |                    |
| Storage temperature range            |   | $T_{stg}$   | -55~+150 |     |     | $^{\circ}\text{C}$ |
| Operating junction temperature range |   | $T_j$       | -55~+150 |     |     | $^{\circ}\text{C}$ |

**Thermal Data**

| Parameter  | Symbol       | Value | Unit                        |
|--|--------------|-------|-----------------------------|
| Thermal Resistance, Junction-to-case, max            | $R_{th,j-c}$ | 20    | $^{\circ}\text{C}/\text{W}$ |
| Thermal Resistance, Junction-to-ambient, max (Note ) | $R_{th,j-a}$ | 95    |                             |

Note : Mounted on PCB with 10mmx10mm copper pad area.

**Characteristics** ( $T_A=25^{\circ}\text{C}$ , unless otherwise noted)

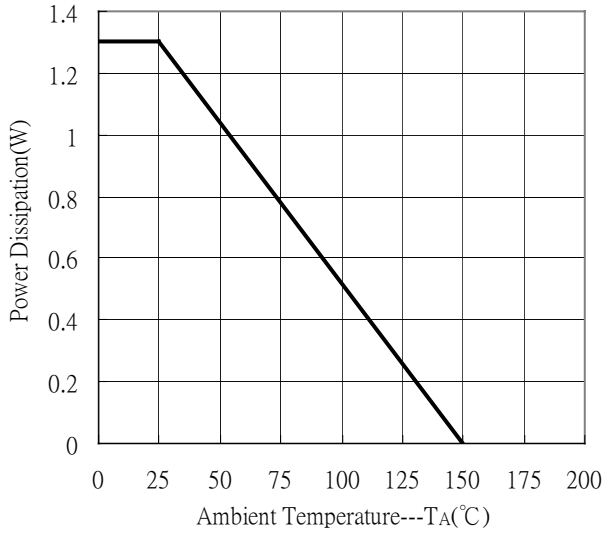
| Characteristic             | Symbol  | Condition                                     | Min. | Typ | Max. | Unit          |
|----------------------------|---------|---|------|-----|------|---------------|
| Continuous reverse voltage | $V_R$   | $I_R=100\mu\text{A}$                          | 620  | -   | -    | V             |
| Forward Voltage            | $V_F 1$ | $I_F=100\text{mA}$                            | -    | -   | 0.95 | V             |
|                            | $V_F 2$ | $I_F=500\text{mA}$                            | -    | -   | 1.2  |               |
| Reverse Leakage Current    | $I_R$   | $V_R=600\text{V}$                             | -    | -   | 100  | nA            |
|                            |         | $V_R=540\text{V}$ , $T_A=125^{\circ}\text{C}$ | -    | -   | 10   | $\mu\text{A}$ |
| Junction Capacitance       | $C_J$   | $V_R=1\text{V}$ , $f=1\text{MHz}$             | -    | 6   | -    | pF            |

**Classification by  $V_R$**

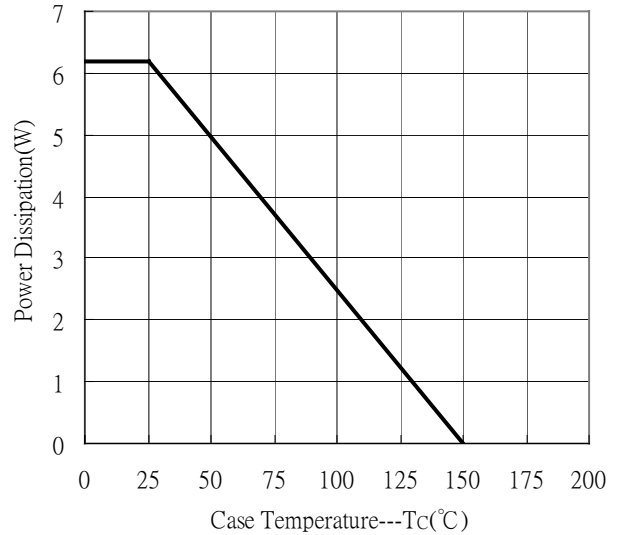
| Rank | 62                | 65                | 70                |
|------|-------------------|-------------------|-------------------|
| Spec | $V_R>620\text{V}$ | $V_R>650\text{V}$ | $V_R>700\text{V}$ |

## Typical Characteristics

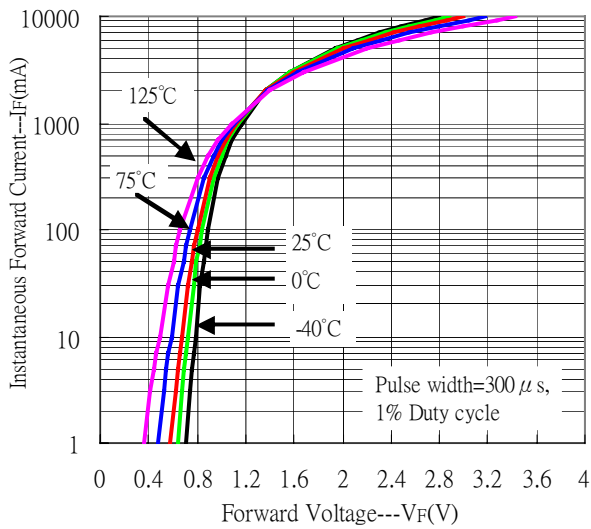
Power Derating Curve



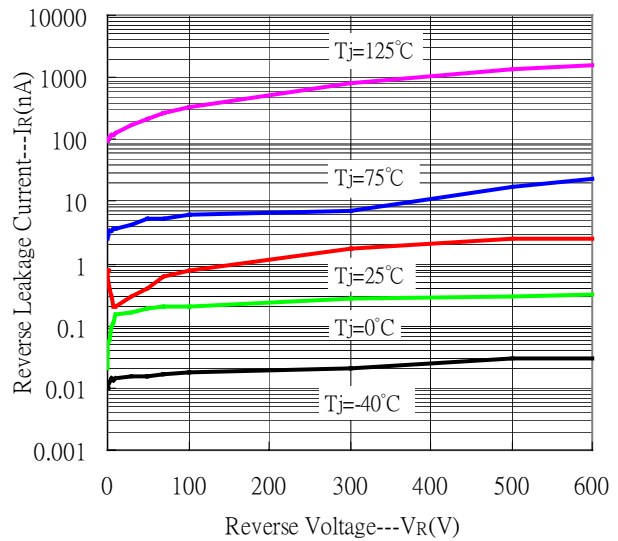
Power Derating Curve



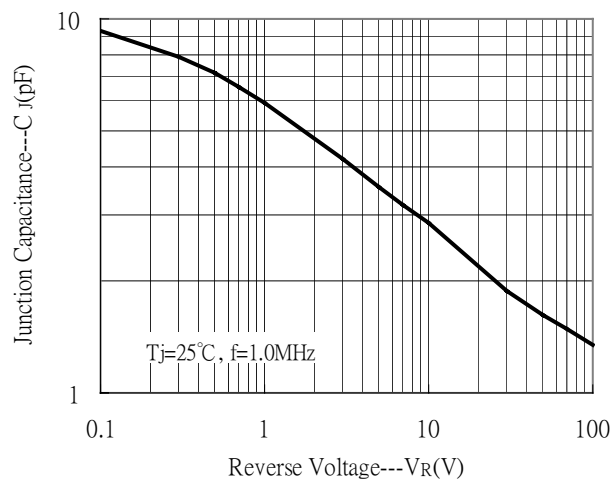
Forward Current vs Forward Voltage



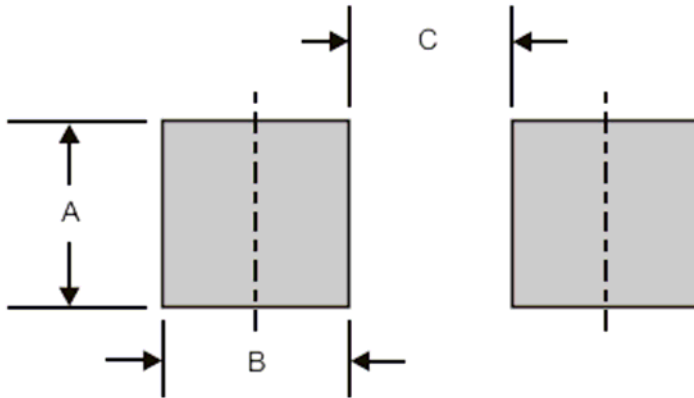
Reverse Leakage Current vs Reverse Voltage



Junction Capacitance vs Reverse Voltage



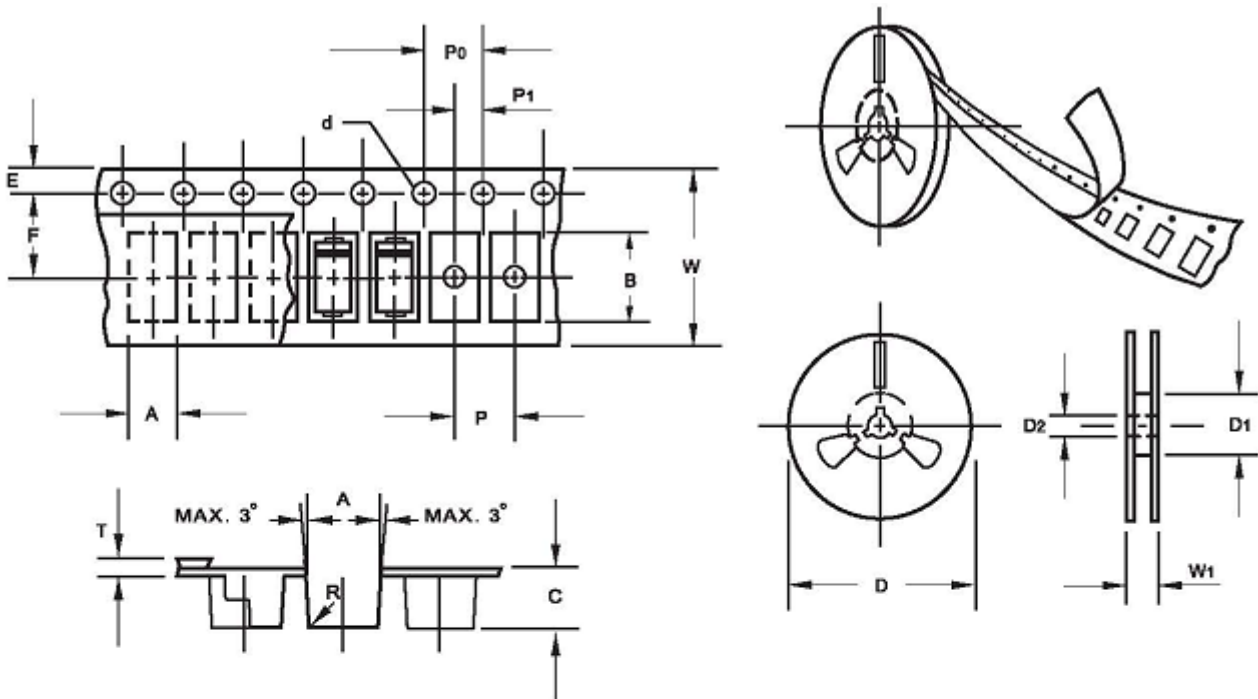
**Recommended Footprint**



Dimensions in inches and (millimeters)

| DIM | Inches | Millimeters |
|-----|--------|-------------|
|     | Typ    | Typ         |
| A   | 0.075  | 1.90        |
| B   | 0.055  | 1.40        |
| C   | 0.075  | 1.90        |

### Taping Reel Dimension



unit : mm

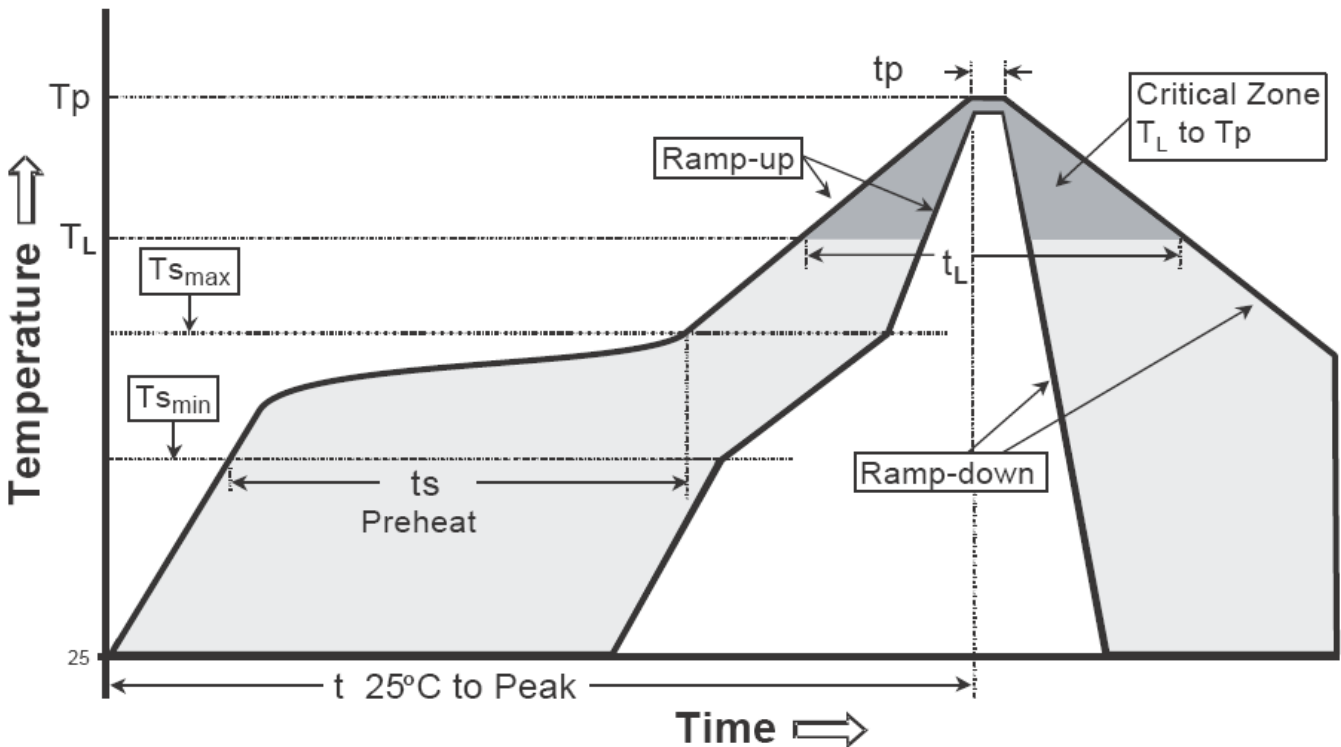
| Item                      | Tolerance | Symbol |        |
|---------------------------|-----------|--------|--------|
| Carrier width             | 0.10      | A      | 2.90   |
| Carrier length            | 0.10      | B      | 5.50   |
| Carrier depth             | 0.10      | C      | 2.10   |
| Sprocket hole             | 0.10      | d      | 1.50   |
| 13" Reel outside diameter | 2.00      | D      | 330.00 |
| 13" Reel inner diameter   | min.      | D1     | 50.00  |
| 7" Reel outside diameter  | 2.00      | D      | 178.00 |
| 7" Reel inner diameter    | min.      | D1     | 62.00  |
| Feed hole diameter        | 0.50      | D2     | 13.00  |
| Sprocket hole position    | 0.10      | E      | 1.75   |
| Punch hole position       | 0.10      | F      | 5.50   |
| Punch hole pitch          | 0.10      | P      | 4.00   |
| Sprocket hole pitch       | 0.10      | P0     | 4.00   |
| Embossment center         | 0.10      | P1     | 2.00   |
| Tape width                | 0.30      | W      | 12.00  |
| Reel width                | 1.00      | W1     | 18.00  |

NOTE: Devices are packed in accordance with EIA standard RS-481-A and specification given above

**Recommended wave soldering condition**

|                 |                  |                 |
|-----------------|------------------|-----------------|
| Product         | Peak Temperature | Soldering Time  |
| Pb-free devices | 260 +0/-5 °C     | 5 +1/-1 seconds |

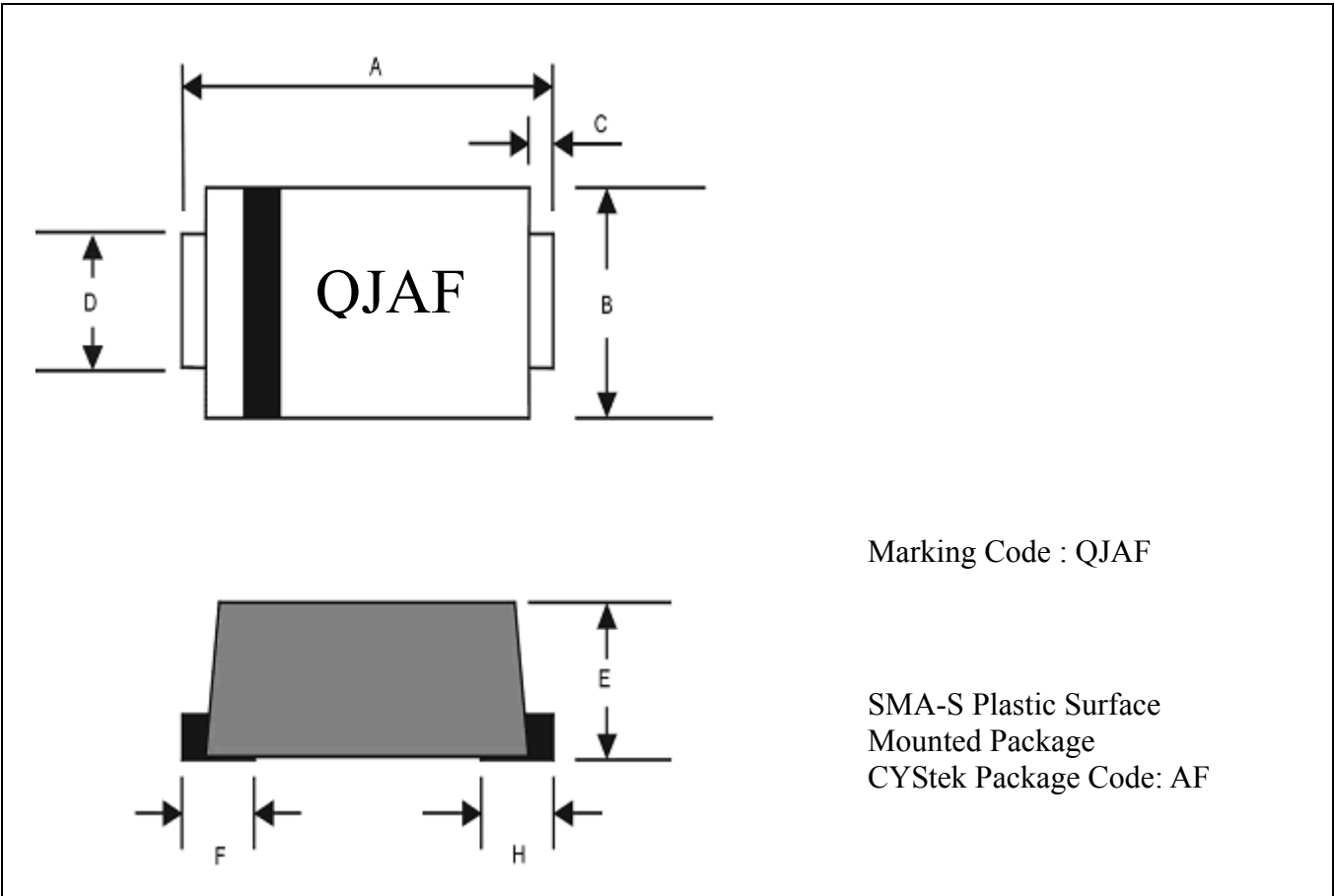
**Recommended temperature profile for IR reflow**



| Profile feature                                | Sn-Pb eutectic Assembly | Pb-free Assembly |
|--|-------------------------|------------------|
| Average ramp-up rate (Tsmax to Tp)             | 3°C/second max.         | 3°C/second max.  |
| Preheat  |                         |                  |
| -Temperature Min(Ts min)                       | 100°C                   | 150°C            |
| -Temperature Max(Ts max)                       | 150°C                   | 200°C            |
| -Time(ts min to ts max)                        | 60-120 seconds          | 60-180 seconds   |
| Time maintained above:                         |                         |                  |
| -Temperature (TL)                              | 183°C                   | 217°C            |
| - Time (tL)                                    | 60-150 seconds          | 60-150 seconds   |
| Peak Temperature(TP)                           | 240 +0/-5 °C            | 260 +0/-5 °C     |
| Time within 5°C of actual peak temperature(tp) | 10-30 seconds           | 20-40 seconds    |
| Ramp down rate                                 | 6°C/second max.         | 6°C/second max.  |
| Time 25 °C to peak temperature                 | 6 minutes max.          | 8 minutes max.   |

Note : All temperatures refer to topside of the package, measured on the package body surface.

**SMA-S/DO-214AC Dimension**



\*:Typical

| DIM | Inches |       | Millimeters |      | DIM | Inches |       | Millimeters |      |
|-----|--------|-------|-------------|------|-----|--------|-------|-------------|------|
|     | Min.   | Max.  | Min.        | Max. |     | Min.   | Max.  | Min.        | Max. |
| A   | 0.197  | 0.213 | 5.0         | 5.4  | E   | 0.060  | 0.071 | 1.5         | 1.8  |
| B   | 0.091  | 0.106 | 2.3         | 2.7  | F   | 0.040* |       | 1.0*        |      |
| C   | 0.012* |       | 0.3*        |      | H   | 0.040* |       | 1.0*        |      |
| D   | 0.055  | 0.063 | 1.4         | 1.6  | -   | -      | -     | -           | -    |

Notes : 1.Controlling dimension : millimeters.  
 2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.  
 3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

**Material :**

- Lead : Pure tin plated.
- Mold Compound : Epoxy resin family, flammability solid burning class:UL94V-0.

**Important Notice:**

- All rights are reserved. Reproduction in whole or in part is prohibited without the prior written approval of CYStek.
- CYStek reserves the right to make changes to its products without notice.
- CYStek **semiconductor products are not warranted to be suitable for use in Life-Support Applications, or systems.**
- CYStek assumes no liability for any consequence of customer product design, infringement of patents, or application assistance.