

# FM5L40-AHST THRU FM5L100-AHST

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## FM5L40-AHST THRU FM5L100-AHST

5.0A Low VF Surface Mount Schottky  
Barrier Rectifiers 40V-100V

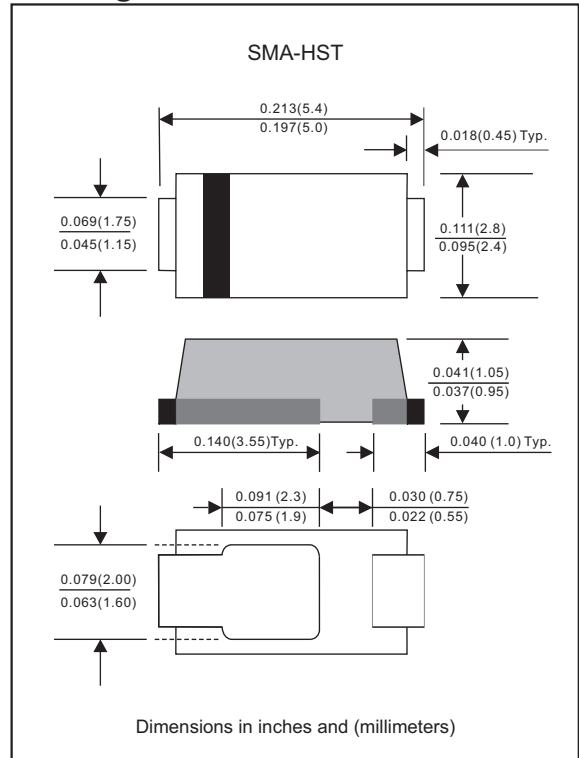
## Features

- High current density schottky
- Very low profile - typical height of 1.0 mm
- Well package design with solder pad on the bottom for best thermal performance
- Ideal for automated placement
- Low power losses, high efficiency
- Low forward voltage drop
- Lead-free parts meet RoHS requirements
- Suffix "-H" indicates Halogen free parts, ex. FM5L40-AHST-H

## Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, DO-221BC / SMA-HST
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity : Indicated by cathode band
- Mounting Position : Any
- Weight : Approximated 0.037 gram

## Package outline

Maximum ratings (AT  $T_A=25^\circ\text{C}$  unless otherwise noted)

| PARAMETER                                                   | SYMBOLS | FM5L40-AHST | FM5L45-AHST | FM5L60-AHST | FM5L100-AHST | UNITS |
|-------------------------------------------------------------|---------|-------------|-------------|-------------|--------------|-------|
| Maximum repetitive peak reverse voltage                     | VRRM    | 40          | 45          | 60          | 100          | Volts |
| Maximum RMS voltage                                         | VRMS    | 28          | 31.5        | 42          | 70           | Volts |
| Maximum continuous reverse voltage                          | VR      | 40          | 45          | 60          | 100          | Volts |
| Maximum average forward rectified current                   | Io      | 5.0         |             |             |              | Amps  |
| Non-repetitive peak forward surge current 1.0ms square-wave | IFSM    | 150         |             |             |              | Amps  |
| Operating junction temperature range                        | TJ      | -55 to +125 |             | -55 to +150 |              | °C    |
| Storage temperature range                                   | TSTG    | -65 to +175 |             |             |              | °C    |

Electrical characteristics (AT  $T_A=25^\circ\text{C}$  unless otherwise noted)

| PARAMETER                                                                                              | SYMBOLS | FM5L40-AHST | FM5L45-AHST | FM5L60-AHST | FM5L100-AHST | UNITS        |
|--------------------------------------------------------------------------------------------------------|---------|-------------|-------------|-------------|--------------|--------------|
| Maximum instantaneous forward voltage at $I_F=5.0\text{A}$                                             | $V_F$   | 0.45        | 0.45        | 0.55        | 0.75         | Volts        |
| Maximum reverse leakage current<br>at rated $V_R$<br>$T_J=25^\circ\text{C}$<br>$T_J=100^\circ\text{C}$ | $I_R$   | 0.5<br>20   |             |             |              | <br>mA<br>mA |

## Thermal characteristics

| PARAMETER                                               | SYMBOLS         | FM5L40-AHST | FM5L45-AHST | FM5L60-AHST | FM5L100-AHST | UNITS                       |
|---------------------------------------------------------|-----------------|-------------|-------------|-------------|--------------|-----------------------------|
| Typical thermal resistance junction to ambient (Note 1) | $R_{\theta JA}$ | 61          |             |             |              | $^\circ\text{C} / \text{W}$ |
| Typical thermal resistance junction to case (Note 1)    | $R_{\theta JC}$ | 31          |             |             |              | $^\circ\text{C} / \text{W}$ |

Note 1: Mounted on FR-4 PCB Copper, minimum recommended pad layout.

## Rating and characteristic curves (FM5L40-AHST THRU FM5L100-AHST)

FIG.1-TYPICAL FORWARD CURRENT DERATING CURVE

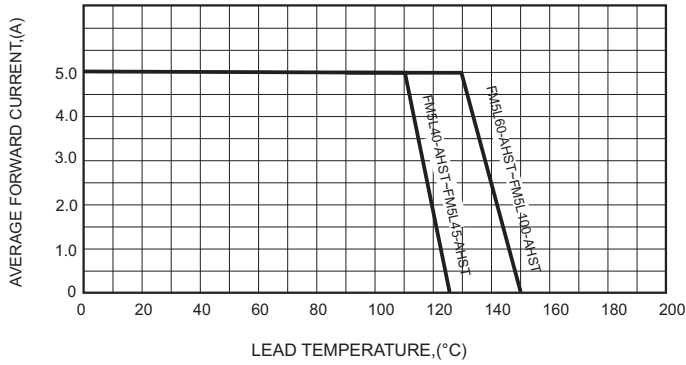


FIG.2-TYPICAL FORWARD CHARACTERISTICS

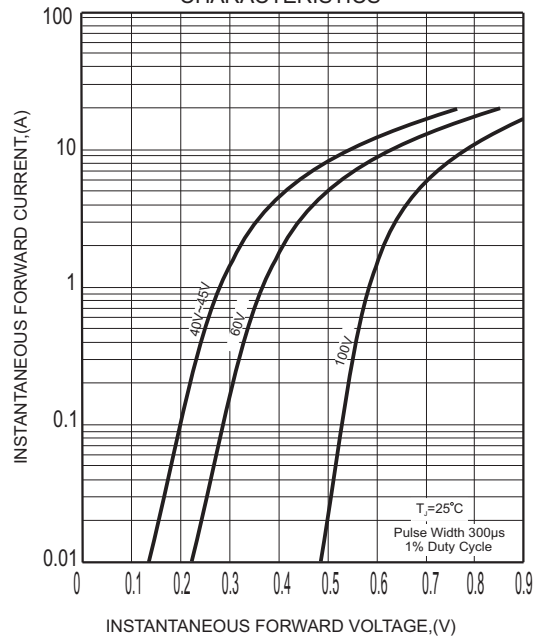


FIG.3-MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT

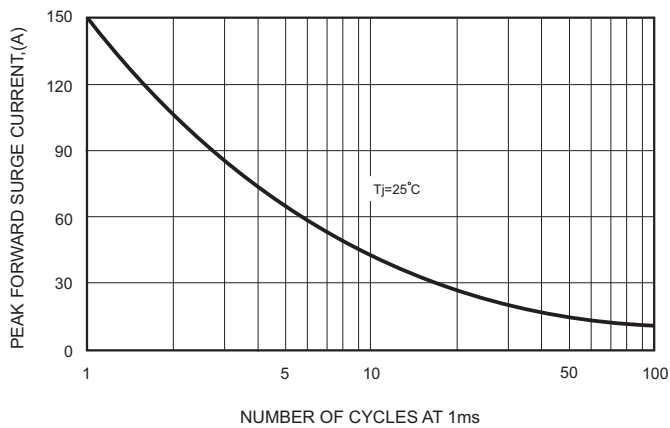
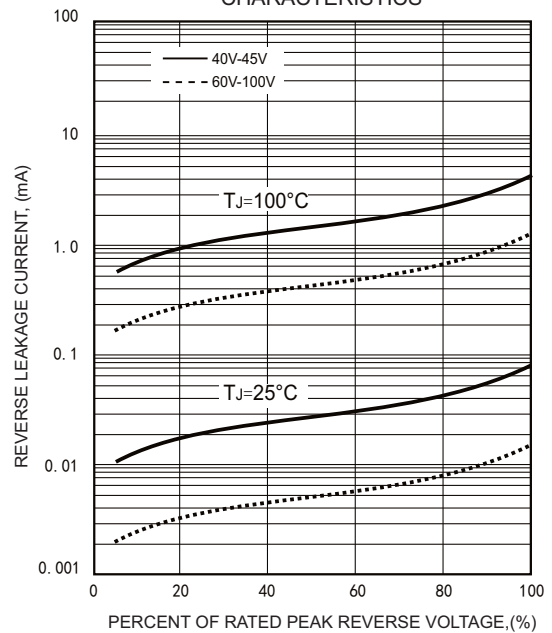


FIG.4 - TYPICAL REVERSE CHARACTERISTICS

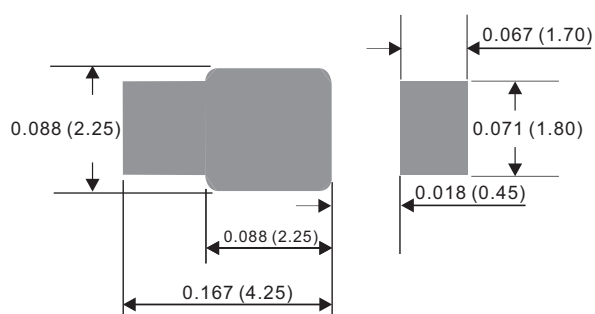


**FM5L40-AHST THRU FM5L100-AHST****Pinning information**

| Pin                        | Simplified outline                                                                | Symbol                                                                              |
|----------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Pin1 cathode<br>Pin2 anode |  |  |

**Marking**

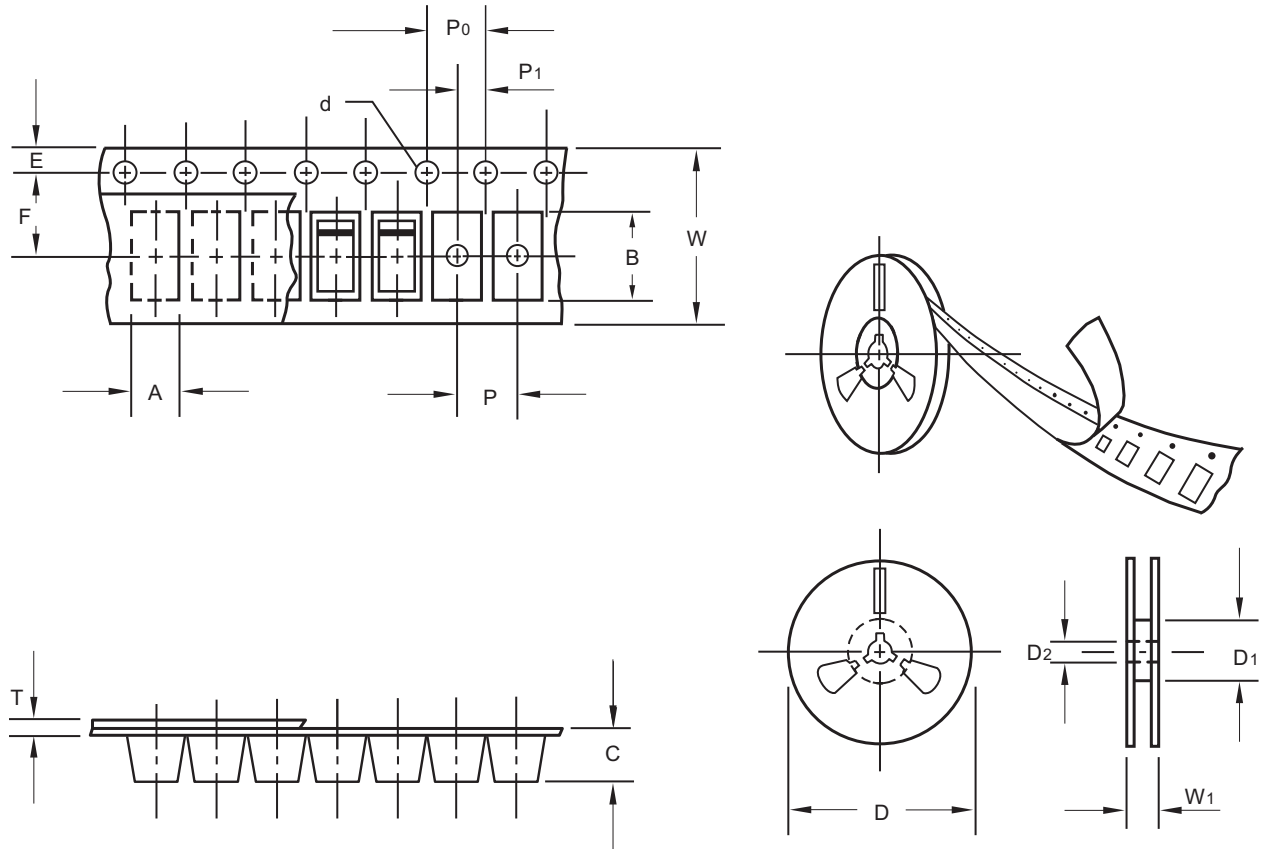
| Type number  | Marking code |
|--------------|--------------|
| FM5L40-AHST  | 5L40         |
| FM5L45-AHST  | 5L45         |
| FM5L60-AHST  | 5L60         |
| FM5L100-AHST | 5L100        |

**Suggested solder pad layout**

Dimensions in inches and (millimeters)

## FM5L40-AHST THRU FM5L100-AHST

## Packing information



unit:mm

| Item                      | Symbol | Tolerance | SMA-HST |
|---------------------------|--------|-----------|---------|
| Carrier width             | A      | 0.1       | 3.00    |
| Carrier length            | B      | 0.1       | 5.50    |
| Carrier depth             | C      | 0.1       | 1.20    |
| Sprocket hole             | d      | 0.1       | 1.50    |
| 13" Reel outside diameter | D      | 2.0       | 330.00  |
| 13" Reel inner diameter   | D1     | min       | 50.00   |
| 7" Reel outside diameter  | D      | 2.0       | 178.00  |
| 7" Reel inner diameter    | D1     | min       | 62.00   |
| Feed hole diameter        | D2     | 0.5       | 13.00   |
| Sprocket hole position    | E      | 0.1       | 1.75    |
| Punch hole position       | F      | 0.1       | 5.50    |
| Punch hole pitch          | P      | 0.1       | 4.00    |
| Sprocket hole pitch       | P0     | 0.1       | 4.00    |
| Embossment center         | P1     | 0.1       | 2.00    |
| Overall tape thickness    | T      | 0.1       | 0.25    |
| Tape width                | W      | 0.3       | 12.00   |
| Reel width                | W1     | 1.0       | 11.40   |

Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

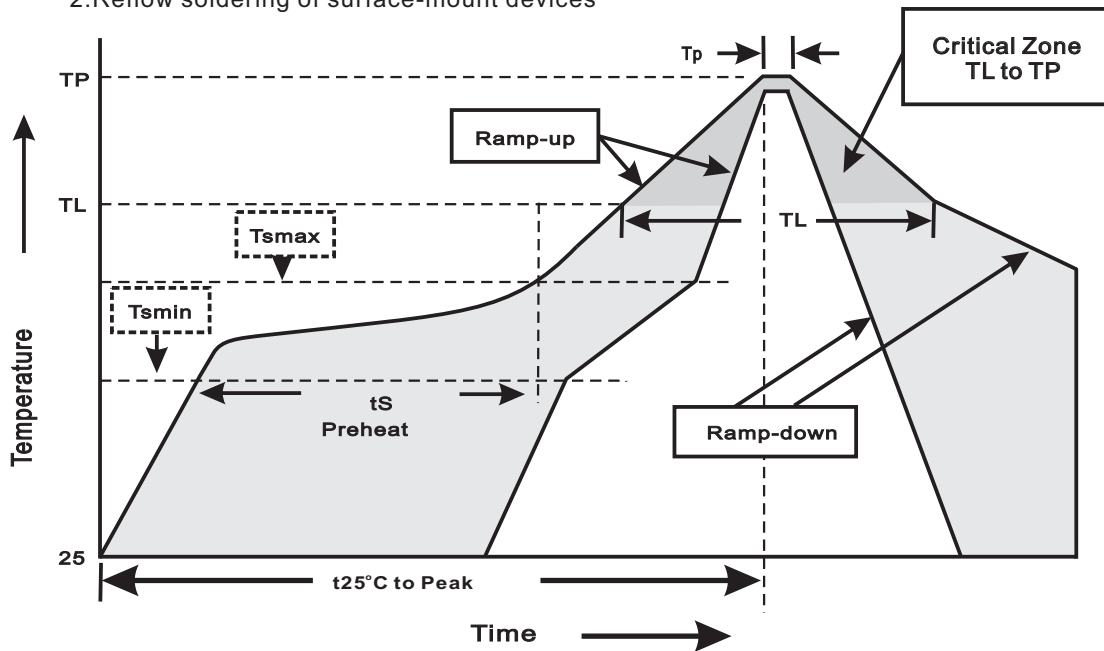
## FM5L40-AHST THRU FM5L100-AHST

## Reel packing

| PACKAGE | REEL SIZE | REEL (pcs) | COMPONENT SPACING (m/m) | BOX (pcs) | INNER BOX (m/m) | REEL DIA, (m/m) | CARTON SIZE (m/m) | CARTON (pcs) | APPROX. GROSS WEIGHT (kg) |
|---------|-----------|------------|-------------------------|-----------|-----------------|-----------------|-------------------|--------------|---------------------------|
| SMA-HST | 7"        | 3,000      | 4.0                     | 30,000    | 183*155*183     | 178             | 382*356*392       | 240,000      | 18.0                      |
|         | 13"       | 10,000     | 4.0                     | 20,000    | 335*335*38      | 330             | 350*330*360       | 160,000      | 15.5                      |

## Suggested thermal profiles for soldering processes

- 1.Storage environment: Temperature=5°C~40°C Humidity=55%±25%
- 2.Reflow soldering of surface-mount devices



## 3.Reflow soldering

| Profile Feature                                                                                                                 | Soldering Condition         |
|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| Average ramp-up rate(T <sub>L</sub> to T <sub>P</sub> )                                                                         | <3°C/sec                    |
| Preheat<br>-Temperature Min(T <sub>smmin</sub> )<br>-Temperature Max(T <sub>smmax</sub> )<br>-Time(min to max)(t <sub>s</sub> ) | 150°C<br>200°C<br>60~120sec |
| T <sub>smmax</sub> to T <sub>L</sub><br>-Ramp-upRate                                                                            | <3°C/sec                    |
| Time maintained above:<br>-Temperature(T <sub>L</sub> )<br>-Time(t <sub>L</sub> )                                               | 217°C<br>60~260sec          |
| Peak Temperature(T <sub>P</sub> )                                                                                               | 255°C-0/+5°C                |
| Time within 5°C of actual Peak Temperature(t <sub>P</sub> )                                                                     | 10~30sec                    |
| Ramp-down Rate                                                                                                                  | <3°C/sec                    |
| Time 25°C to Peak Temperature                                                                                                   | <6minutes                   |

**FM5L40-AHST THRU FM5L100-AHST****High reliability test capabilities**

| Item Test                         | Conditions                                                                                                                                 | Reference                     |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| 1. Solder Resistance              | at $260 \pm 5^{\circ}\text{C}$ for $10 \pm 2\text{sec.}$                                                                                   | MIL-STD-750D<br>METHOD-2031   |
| 2. Solderability                  | at $245 \pm 5^{\circ}\text{C}$ for 5 sec.                                                                                                  | MIL-STD-202F<br>METHOD-208    |
| 3. High Temperature Reverse Bias  | $V_R = 80\%$ rate at $T_J = 125^{\circ}\text{C}$ for 168 hrs.                                                                              | MIL-STD-750D<br>METHOD-1038   |
| 4. Forward Operation Life         | Rated average rectifier current at $T_A = 25^{\circ}\text{C}$ for 500hrs.                                                                  | MIL-STD-750D<br>METHOD-1027   |
| 5. Intermittent Operation Life    | $T_A = 25^{\circ}\text{C}$ , $I_F = I_O$<br>On state: power on for 5 min.<br>off state: power off for 5 min.<br>on and off for 500 cycles. | MIL-STD-750D<br>METHOD-1036   |
| 6. Pressure Cooker                | $15P_{SIG}$ at $T_A = 121^{\circ}\text{C}$ for 4 hrs.                                                                                      | JESD22-A102                   |
| 7. Temperature Cycling            | $-55^{\circ}\text{C}$ to $+125^{\circ}\text{C}$ dwelled for 30 min.<br>and transferred for 5min. total 10 cycles.                          | MIL-STD-750D<br>METHOD-1051   |
| 8. Forward Surge                  | 1.0ms square-wave , one surge.                                                                                                             | MIL-STD-750D<br>METHOD-4066-2 |
| 9. Humidity                       | at $T_A = 85^{\circ}\text{C}$ , RH=85% for 1000hrs.                                                                                        | MIL-STD-750D<br>METHOD-1021   |
| 10. High Temperature Storage Life | at $175^{\circ}\text{C}$ for 1000 hrs.                                                                                                     | MIL-STD-750D<br>METHOD-1031   |