

# SSL14 / SLL14

## List

|                                                         |   |
|---------------------------------------------------------|---|
| List.....                                               | 1 |
| Package outline.....                                    | 2 |
| Features.....                                           | 2 |
| Mechanical data.....                                    | 2 |
| Maximum ratings .....                                   | 2 |
| Rating and characteristic curves.....                   | 3 |
| Pinning information.....                                | 4 |
| Marking.....                                            | 4 |
| Suggested solder pad layout.....                        | 4 |
| Packing information.....                                | 5 |
| Reel packing.....                                       | 6 |
| Suggested thermal profiles for soldering processes..... | 6 |
| High reliability test capabilities.....                 | 7 |

# SSL14 / SLL14

## 1.0A Surface Mount Super Low Forward Schottky Barrier Rectifiers - 40V

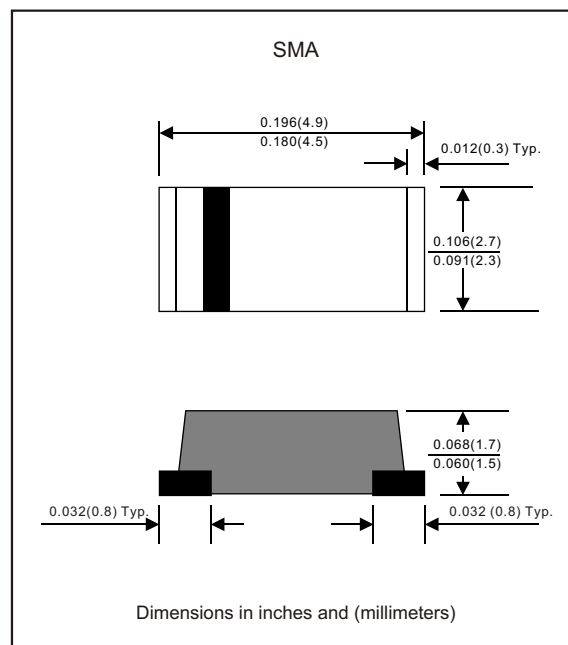
### Package outline

### Features

- Batch process design, excellent power dissipation offers better reverse leakage current and thermal resistance.
- Low profile surface mounted application in order to optimize board space.
- Low power loss, high efficiency.
- High current capability, low forward voltage drop.
- High surge capability.
- Guardring for overvoltage protection.
- Ultra high-speed switching.
- Silicon epitaxial planar chip, metal silicon junction.
- Suffix "-H" indicates Halogen-free part, ex. SSL14-H.
- Lead-free parts meet environmental standards of MIL-STD-19500 / 228

### Mechanical data

- Epoxy: UL94-V0 rated flame retardant
- Case : Molded plastic, DO-214AC / SMA
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity : Indicated by cathode band
- Mounting Position : Any
- Weight : Approximated 0.05 gram



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

| PARAMETER                  | CONDITIONS                                                           | Symbol          | MIN. | TYP. | MAX.     | UNIT                 |
|----------------------------|----------------------------------------------------------------------|-----------------|------|------|----------|----------------------|
| Forward rectified current  | See Fig.2                                                            | $I_O$           |      |      | 1.0      | A                    |
| Forward surge current      | 8.3ms single halfsine-wave superimposed on rate load (JEDEC methode) | $I_{FSM}$       |      |      | 90<br>70 | A                    |
| Reverse current            | $V_R = V_{RRM} \quad T_A = 25^{\circ}\text{C}$                       | $I_R$           |      |      | 1.0      | mA                   |
|                            | $V_R = V_{RRM} \quad T_A = 125^{\circ}\text{C}$                      |                 |      |      | 10       |                      |
| Thermal resistance         | Junction to ambient                                                  | $R_{\theta JA}$ |      | 50   |          | $^{\circ}\text{C/W}$ |
| Diode junction capacitance | f=1MHz and applied 4V DC reverse voltage                             | $C_J$           |      | 300  |          | pF                   |
| Storage temperature        |                                                                      | $T_{STG}$       | -65  |      | +175     | $^{\circ}\text{C}$   |

| SYMBOLS | $V_{RRM}^{*1}$<br>(V) | $V_{RMS}^{*2}$<br>(V) | $V_R^{*3}$<br>(V) | $V_F^{*4}$<br>(V) | Operating temperature<br>$T_{J^*}$ ( $^{\circ}\text{C}$ ) |
|---------|-----------------------|-----------------------|-------------------|-------------------|-----------------------------------------------------------|
| SSL14   | 40                    | 28                    | 40                | 0.32              | -55 to +125                                               |
| SLL14   | 40                    | 28                    | 40                | 0.34              |                                                           |

\*1 Repetitive peak reverse voltage

\*2 RMS voltage

\*3 Continuous reverse voltage

\*4 Maximum forward voltage @1.0A

## Rating and characteristic curves (SSL14 / SLL14)

FIG.1-MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT

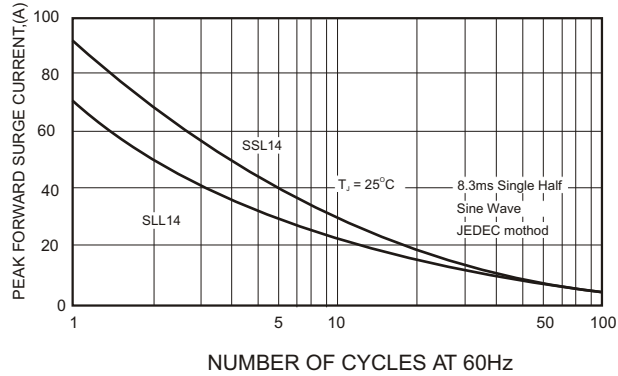


FIG.2-TYPICAL FORWARD CURRENT DERATING CURVE

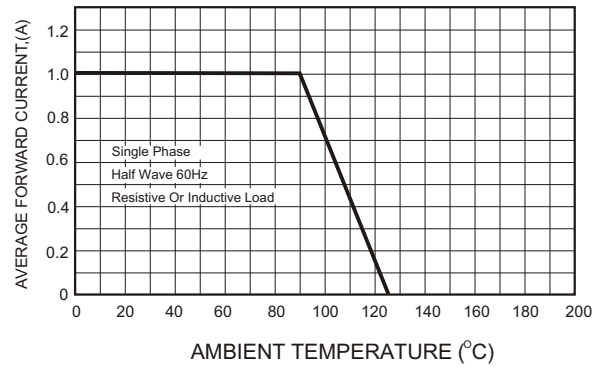


FIG.3-TYPICAL JUNCTION CAPACITANCE

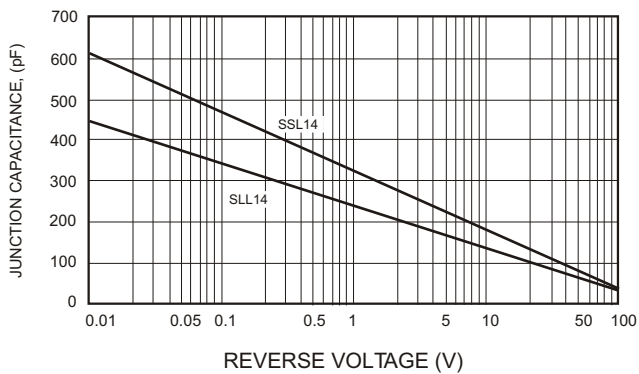


FIG.4-TYPICAL FORWARD CHARACTERISTICS(FOR SLL14)

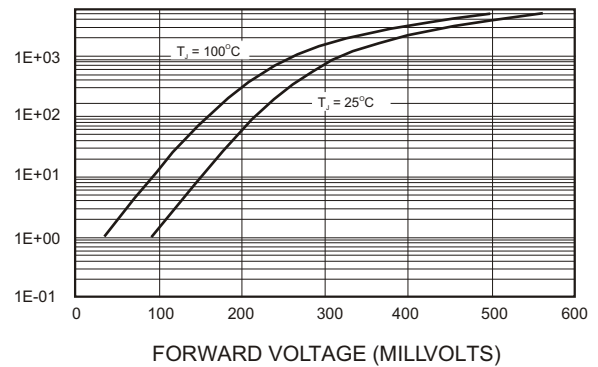


FIG.5 - TYPICAL REVERSE CHARACTERISTICS

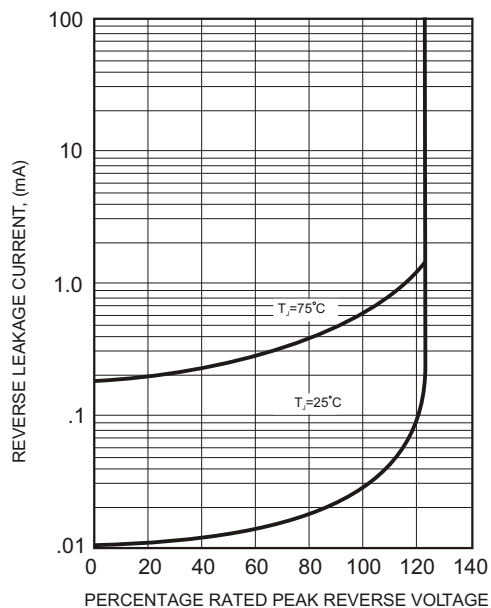
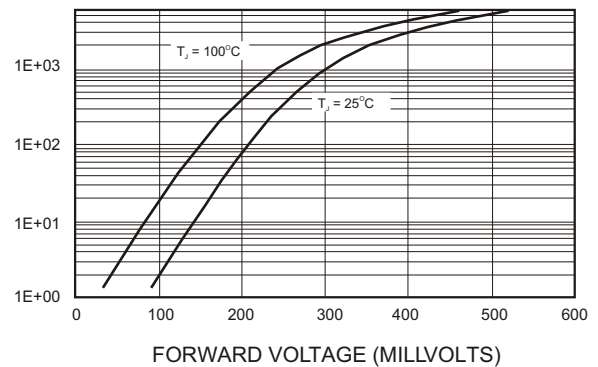


FIG.6-TYPICAL FORWARD CHARACTERISTICS(FOR SSL14)



# SSL14 / SLL14

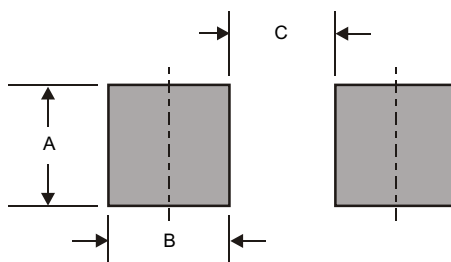
## Pinning information

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

## Marking

| Type number | Marking code |
|-------------|--------------|
| SSL14       | LS14         |
| SLL14       | LL14         |

## Suggested solder pad layout

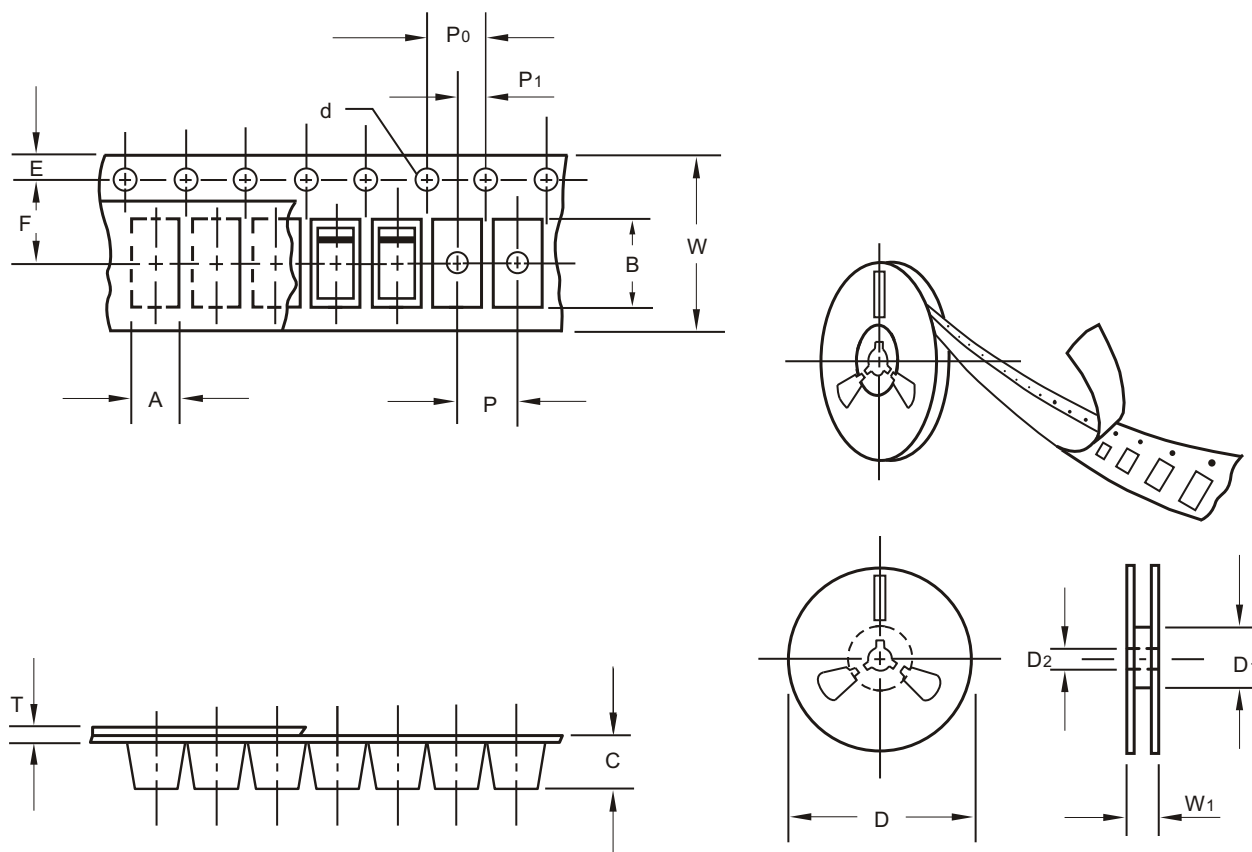


Dimensions in inches and (millimeters)

| PACKAGE | A            | B            | C            |
|---------|--------------|--------------|--------------|
| SMA     | 0.110 (2.80) | 0.063 (1.60) | 0.087 (2.20) |

## SSL14 / SLL14

## Packing information



unit:mm

| Item                      | Symbol | Tolerance | SMA    |
|---------------------------|--------|-----------|--------|
| Carrier width             | A      | 0.1       | 2.80   |
| Carrier length            | B      | 0.1       | 5.00   |
| Carrier depth             | C      | 0.1       | 1.90   |
| 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       | 0.23   |
| Tape width                | W      | 0.3       | 12.00  |
| Reel width                | W1     | 1.0       | 18.00  |

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

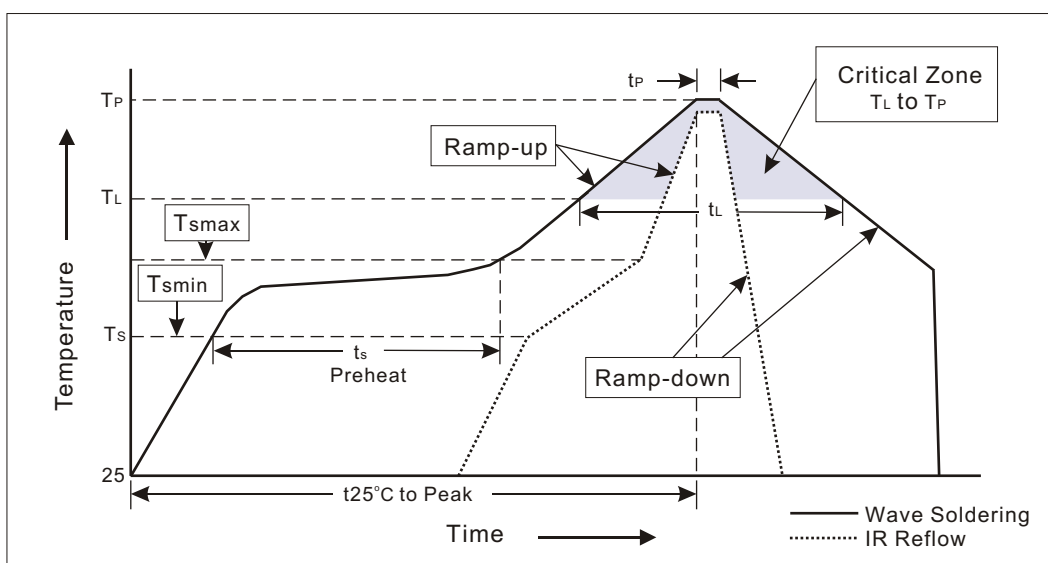
# SSL14 / SLL14

## 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     | 7"        | 2,000      | 4.0                     | 20,000    | 183*170*183     | 178             | 382*356*387       | 160,000      | 16.0                      |
| SMA     | 13"       | 7,500      | 4.0                     | 15,000    | 337*337*37      | 330             | 350*330*360       | 120,000      | 14.2                      |

## Suggested thermal profiles for soldering processes

- 1.Storage environment: Temperature=10°C~35°C Humidity=65%±15%
- 2.Reflow soldering of surface-mount devices



### 3.Flow (wave)soldering (solder dipping)

| Profile Feature                                                                                           | Soldering Condition         |
|-----------------------------------------------------------------------------------------------------------|-----------------------------|
| Average ramp-up rate( $T_L$ to $T_P$ )                                                                    | <3°C/sec                    |
| Preheat<br>-Temperature Min( $T_{Smin}$ )<br>-Temperature Max( $T_{Smax}$ )<br>-Time(min to max)( $t_s$ ) | 100°C<br>150°C<br>60~120sec |
| $T_{Smax}$ to $T_L$<br>-Ramp-upRate                                                                       | <3°C/sec                    |
| Time maintained above:<br>-Temperature( $T_L$ )<br>-Time( $t_L$ )                                         | 183°C<br>60~150sec          |
| Peak Temperature( $T_P$ )                                                                                 | 255°C-0/+5°C                |
| Time within 5°C of actual Peak Temperature( $t_P$ )                                                       | 10~30sec                    |
| Ramp-down Rate                                                                                            | <6°C/sec                    |
| Time 25°C to Peak Temperature                                                                             | <6minutes                   |

**SSL14 / SLL14****High reliability test capabilities**

| Item Test                         | Conditions                                                                                                                                 | Reference                     |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| 1. Solder Resistance              | at $260\pm5^{\circ}\text{C}$ for $10\pm2\text{sec.}$<br>immerse body into solder $1/16''\pm1/32''$                                         | MIL-STD-750D<br>METHOD-2031   |
| 2. Solderability                  | at $245\pm5^{\circ}\text{C}$ 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-1026   |
| 4. Forward Operation Life         | Rated average rectifier current at $T=25^{\circ}\text{C}$ 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.                                                                                        |                               |
| 7. Temperature Cycling            | $-55^{\circ}\text{C}$ to $+125^{\circ}\text{C}$ dwelled for 30 min.<br>and transferred for 5 min. total 10 cycles.                         | MIL-STD-750D<br>METHOD-1051   |
| 8. Thermal Shock                  | $0^{\circ}\text{C}$ for 5 min. rise to $100^{\circ}\text{C}$ for 5 min. total 10 cycles.                                                   | MIL-STD-750D<br>METHOD-1056   |
| 9. Forward Surge                  | 8.3ms single half sine-wave superimposed<br>on rated load, one surge.                                                                      | MIL-STD-750D<br>METHOD-4066-2 |
| 10. Humidity                      | at $T_A=65^{\circ}\text{C}$ , RH=98% for 1000hrs.                                                                                          | MIL-STD-750D<br>METHOD-1038   |
| 11. High Temperature Storage Life | at $175^{\circ}\text{C}$ for 1000hrs.                                                                                                      | MIL-STD-750D<br>METHOD-1031   |
| 12. Solvent Resistance            | Dip into Freon at $25^{\circ}\text{C}$ for 1 min.                                                                                          | MIL-STD-202F<br>METHOD-215    |