

# SKFM20L60CW-D

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# SKFM20L60CW-D

## 20Amp Surface Mount Schottky Barrier Rectifiers : 60V

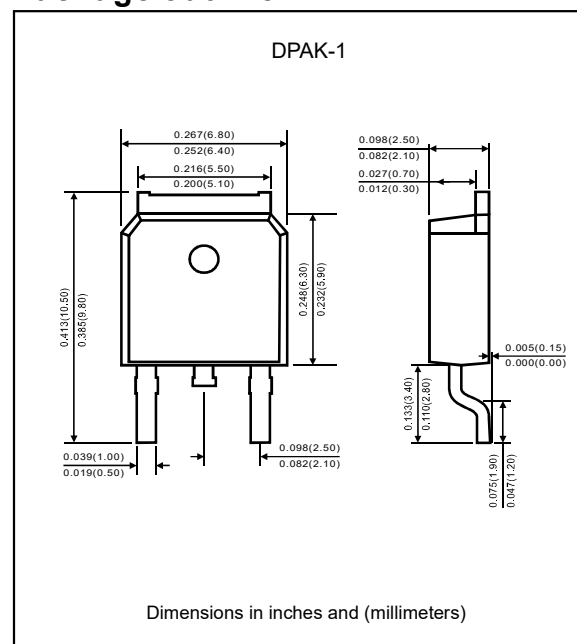
### Features

- The plastic package carries underwrites laboratory flammability classification 94V-0.
- Construction utilizes void-free molded plastic technique.
- Low reverse leakage.
- High forward surge current capability.
- High temperature soldering guaranteed 260°C/10sec at terminals.
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC.
- Suffix "-H" indicates Halogen free parts, ex. SKFM20L60CW-D-H.

### Mechanical data

- Epoxy: UL94-V0 rated flame retardant.
- Case : Molded plastic, DPAK-1 (TO-252).
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026.
- Polarity : Indicated by cathode band.
- Mounting Position : Any.
- Weight : Approximated 0.34 gram.

### Package outline



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

| Parameter                                                                         | Symbol          | Value       | Unit               |
|-----------------------------------------------------------------------------------|-----------------|-------------|--------------------|
| Maximum repetitive reverse voltage                                                | $V_{RRM}$       | 60          | V                  |
| Maximum RMS voltage                                                               | $V_{RMS}$       | 56          | V                  |
| Maximum DC blocking voltage                                                       | $V_{DC}$        | 60          | V                  |
| Maximum average forward Per device rectified current at $T_C=110^\circ\text{C}$   | $I_{(AV)}$      | 20<br>10    | A                  |
| Peak forward surge current 8.3ms single half sine-wave superimposed on rated load | $I_{FSM}$       | 150         | A                  |
| Thermal resistance, Junction to case                                              | $R_{\theta JC}$ | 2.5         | $^\circ\text{C/W}$ |
| Operating junction temperature                                                    | $T_J$           | +150        | $^\circ\text{C}$   |
| Storage temperature range                                                         | $T_{STG}$       | -50 to +150 | $^\circ\text{C}$   |

### Electrical characteristics (At $T_A=25^\circ\text{C}$ , Ambient temperature unless otherwise specified)

| Parameter                                                                                                 | Symbol | Conditions                   | Min. | Typ.      | Max.       | Unit |
|-----------------------------------------------------------------------------------------------------------|--------|------------------------------|------|-----------|------------|------|
| Maximum instantaneous forward voltage                                                                     | $V_F$  | $I_F=10\text{A}$ (Per diode) |      | 0.53      | 0.58       | V    |
| Maximum DC reverse current $T_A=25^\circ\text{C}$<br>at rated DC blocking voltage $T_A=100^\circ\text{C}$ | $I_R$  | $V_R=60\text{V}$             |      | 0.03<br>5 | 0.20<br>20 | mA   |

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## Rating and characteristic curves

FIG. 1- DERATING CURVE OUTPUT RECTIFIED CURRENT

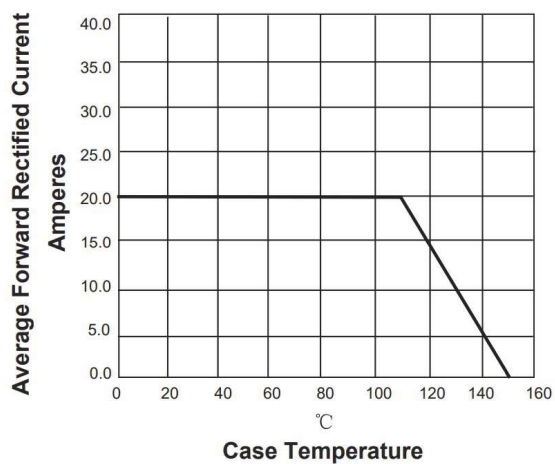


FIG. 2-MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER LEG

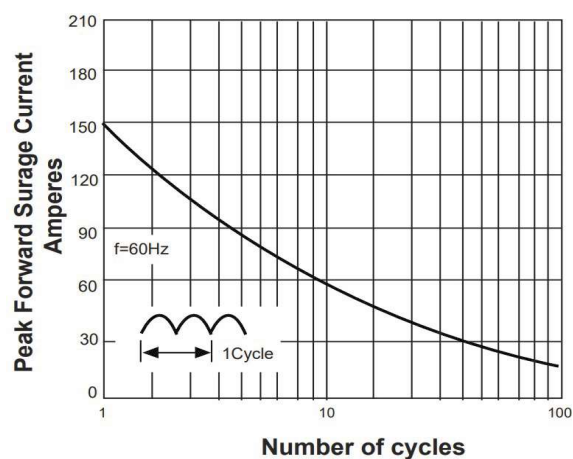


FIG. 3-TYPICAL FORWARD VOLTAGE CHARACTERISTICS

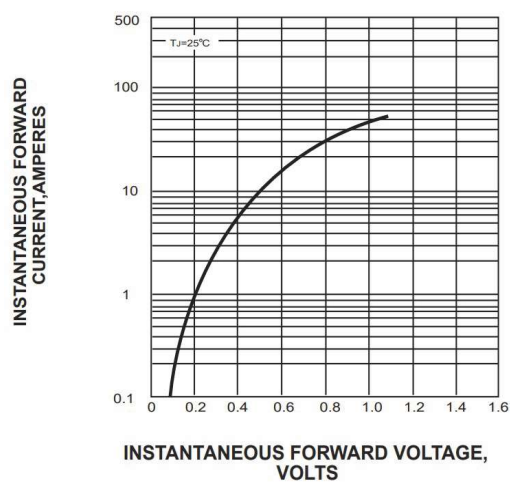
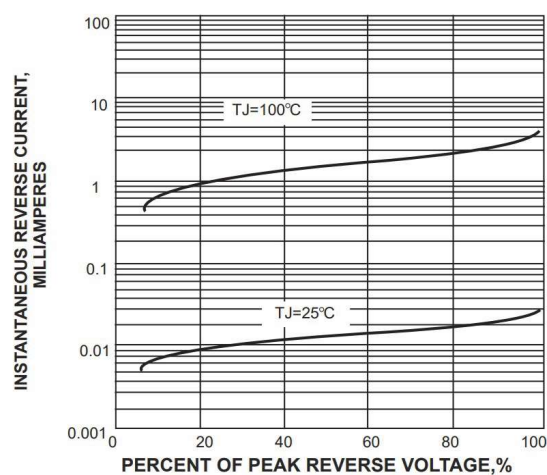
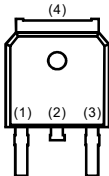
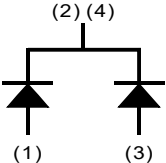


FIG. 4-TYPICAL REVERSE LEAKAGE CHARACTERISTICS

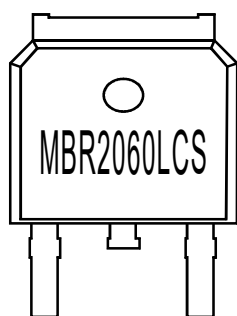


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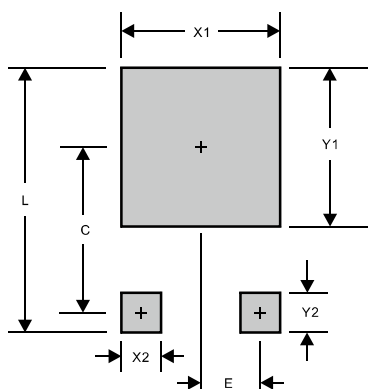
## Pinning information

| Pin                              | Simplified outline                                                                | Symbol                                                                              |
|----------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Pin1, 3 Anode<br>Pin2, 4 Cathode |  |  |

## Marking



## Suggested solder pad layout

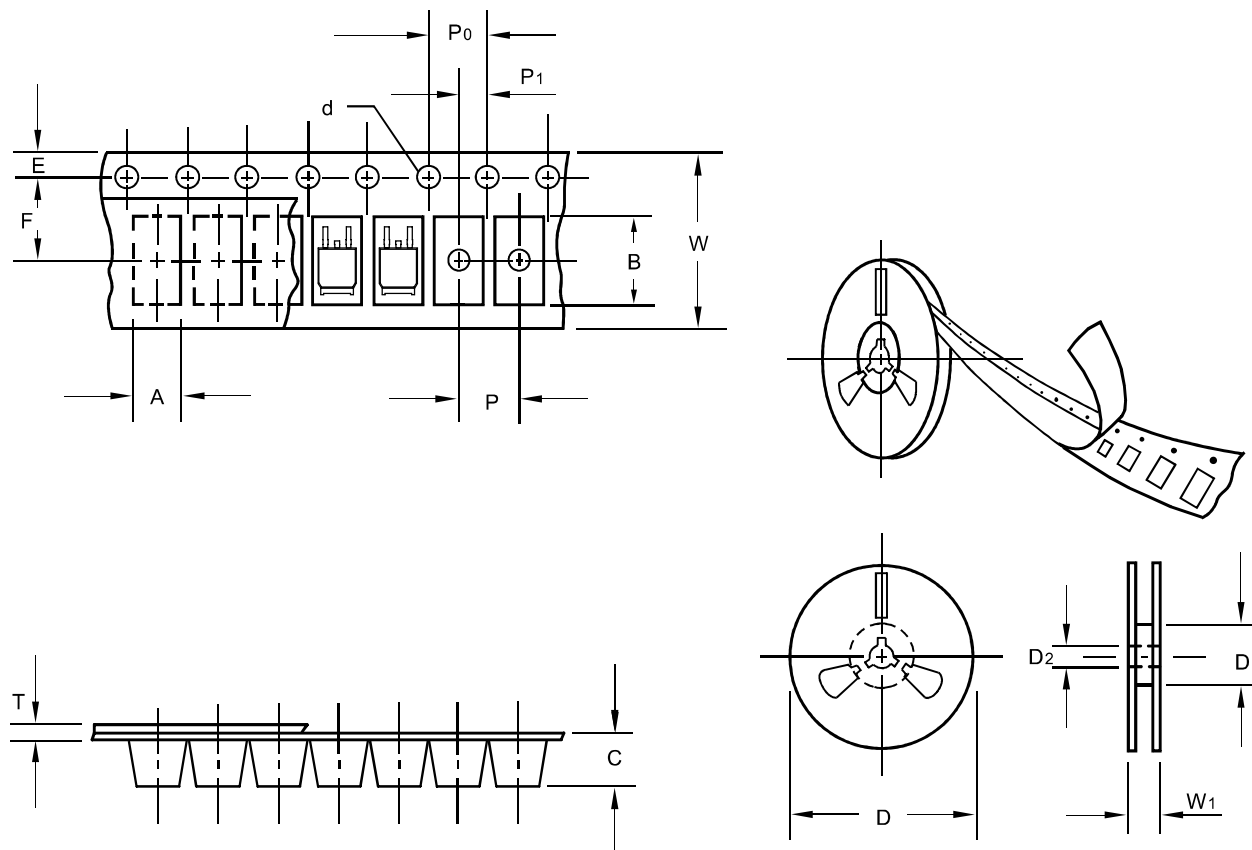


| PACKAGE | DPAK-1       |
|---------|--------------|
| C       | 0.261(6.64)  |
| E       | 0.091(2.30)  |
| L       | 0.457(11.60) |
| X1      | 0.240(6.10)  |
| X2      | 0.056(1.42)  |
| Y1      | 0.298(7.57)  |
| Y2      | 0.109(2.76)  |

Dimensions in inches and (millimeters)

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## Packing information



unit:mm

| Item                      | Symbol | Tolerance | DPAK-1 |
|---------------------------|--------|-----------|--------|
| Carrier width             | A      | 0.1       | 6.90   |
| Carrier length            | B      | 0.1       | 10.50  |
| Carrier depth             | C      | 0.1       | 2.70   |
| Sprocket hole             | d      | 0.1       | 1.55   |
| 13" Reel outside diameter | D      | 2.0       | 330.00 |
| 13" Reel inner diameter   | D1     | min       | 50.00  |
| 7" Reel outside diameter  | D      | 2.0       | -      |
| 7" Reel inner diameter    | D1     | min       | -      |
| Feed hole diameter        | D2     | 0.5       | 13.00  |
| Sprocket hole position    | E      | 0.1       | 1.75   |
| Punch hole position       | F      | 0.1       | 7.50   |
| Punch hole pitch          | P      | 0.1       | 8.00   |
| Sprocket hole pitch       | P0     | 0.1       | 4.00   |
| Embossment center         | P1     | 0.1       | 2.00   |
| Overall tape thickness    | T      | 0.1       | 0.30   |
| Tape width                | W      | 0.3       | 16.00  |
| Reel width                | W1     | 1.0       | 22.00  |

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

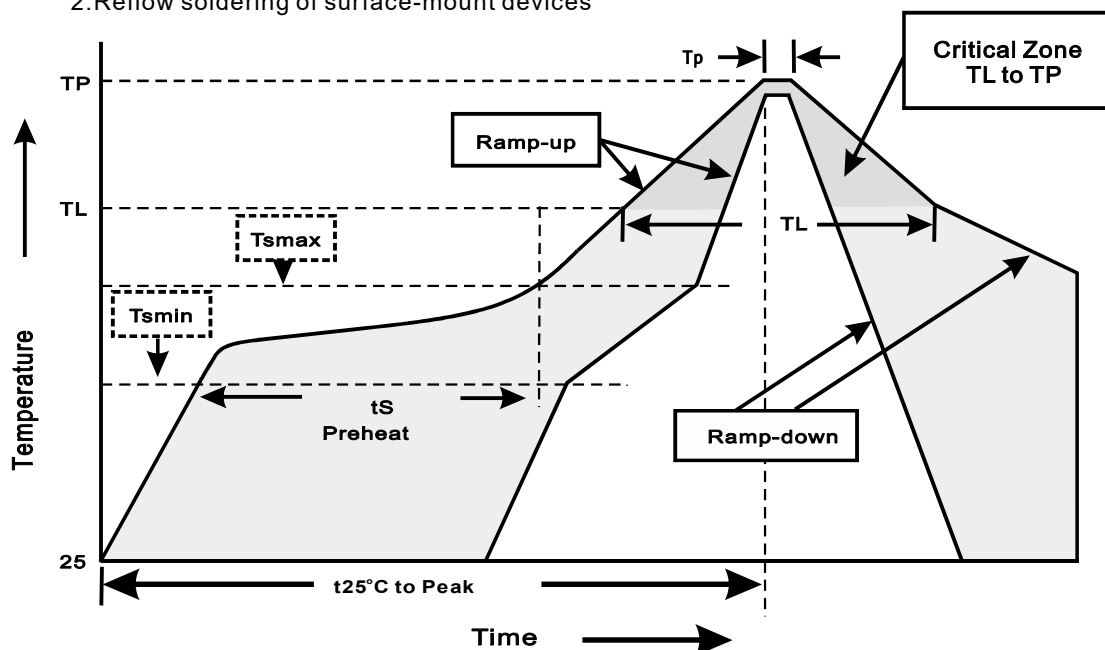
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## Reel packing

| 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) |
|----------------|-----------|------------|-------------------------|-----------|-----------------|-----------------|-------------------|--------------|---------------------------|
| DPAK-1/ TO-252 | 13"       | 2,500      | 8.0                     | 5,000     | 335*335*38      | 330             | 350*350*225       | 25,000       | 15.0                      |

## 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( $T_L$ to $T_P$ )                                                                    | $<3^{\circ}\text{C}/\text{sec}$ |
| Preheat<br>-Temperature Min( $T_{smin}$ )<br>-Temperature Max( $T_{smax}$ )<br>-Time(min to max)( $t_s$ ) | 150°C<br>200°C<br>60~120sec     |
| $T_{smax}$ to $T_L$<br>-Ramp-upRate                                                                       | $<3^{\circ}\text{C}/\text{sec}$ |
| Time maintained above:<br>-Temperature( $T_L$ )<br>-Time( $t_L$ )                                         | 217°C<br>60~260sec              |
| Peak Temperature( $T_P$ )                                                                                 | 255°C-0/+5°C                    |
| Time within 5°C of actual Peak Temperature( $t_P$ )                                                       | 10~30sec                        |
| Ramp-down Rate                                                                                            | $<6^{\circ}\text{C}/\text{sec}$ |
| Time 25°C to Peak Temperature                                                                             | $<6\text{minutes}$              |

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## High reliability test capabilities

| Item Test                         | Conditions                                                                                                                               | Reference                     |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| 1. Solder Resistance              | at $260 \pm 5^\circ\text{C}$ for $10 \pm 2\text{sec.}$<br>immerse body into solder $1/16" \pm 1/32"$                                     | 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                  | 8.3ms single half sine-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 $150^\circ\text{C}$ for 1000 hrs.                                                                                                     | MIL-STD-750D<br>METHOD-1031   |