

# SKFM1620C-D2 THRU SKFM16200C-D2

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# SKFM1620C-D2 THRU SKFM16200C-D2

## 16.0A Surface Mount Schottky Barrier Rectifiers - 20V-200V

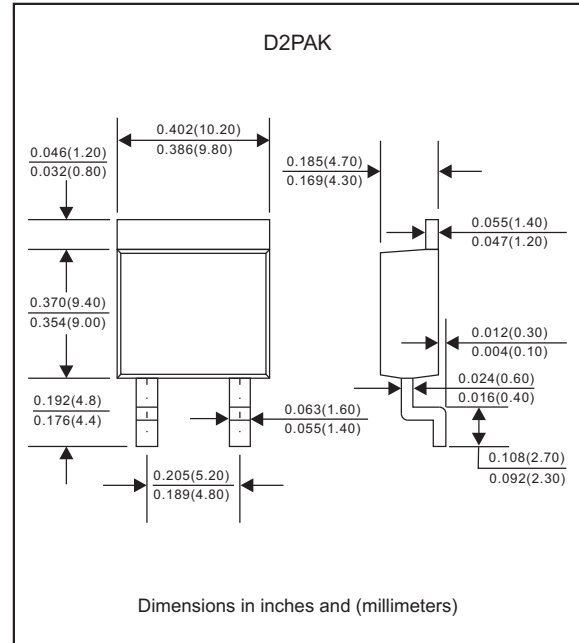
### Features

- Batch process design, excellent power dissipation offers better reverse leakage current and thermal resistance.
- 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.
- Lead-free parts meet environmental standards of MIL-STD-19500 /228
- Suffix "-H" indicates Halogen free parts, ex.SKFM1620C-D2-H.

### Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, TO-263 / D2PAK
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Mounting Position : Any
- Weight : Approximated 1.46 gram

### Package outline



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

| PARAMETER                 | CONDITIONS                                      | Symbol    | MIN. | TYP. | MAX. | UNIT               |
|---------------------------|-------------------------------------------------|-----------|------|------|------|--------------------|
| Forward rectified current | See Fig.1                                       | $I_O$     |      |      | 16.0 | A                  |
| Forward surge current     | 8.3ms single half sine-wave (JEDEC methode)     | $I_{FSM}$ |      |      | 150  | A                  |
| Reverse current           | $V_R = V_{RRM} \quad T_J = 25^{\circ}\text{C}$  | $I_R$     |      |      | 0.5  | mA                 |
|                           | $V_R = V_{RRM} \quad T_J = 100^{\circ}\text{C}$ |           |      |      | 50   |                    |
| Storage temperature       |                                                 | $T_{STG}$ | -65  |      | +175 | $^{\circ}\text{C}$ |

| SYMBOLS       | V <sub>RRM</sub> <sup>*1</sup><br>(V) | V <sub>RMS</sub> <sup>*2</sup><br>(V) | V <sub>R</sub> <sup>*3</sup><br>(V) | V <sub>F</sub> <sup>*4</sup><br>(V) | Operating temperature<br>T <sub>J</sub> , (°C) |
|---------------|---------------------------------------|---------------------------------------|-------------------------------------|-------------------------------------|------------------------------------------------|
| SKFM1620C-D2  | 20                                    | 14                                    | 20                                  | 0.55                                | -55 to +125                                    |
| SKFM1630C-D2  | 30                                    | 21                                    | 30                                  |                                     |                                                |
| SKFM1640C-D2  | 40                                    | 28                                    | 40                                  |                                     |                                                |
| SKFM1645C-D2  | 45                                    | 31.5                                  | 45                                  |                                     |                                                |
| SKFM1650C-D2  | 50                                    | 35                                    | 50                                  | 0.70                                | -55 to +150                                    |
| SKFM1660C-D2  | 60                                    | 42                                    | 60                                  |                                     |                                                |
| SKFM1680C-D2  | 80                                    | 56                                    | 80                                  | 0.85                                |                                                |
| SKFM16100C-D2 | 100                                   | 70                                    | 100                                 |                                     |                                                |
| SKFM16150C-D2 | 150                                   | 105                                   | 150                                 | 0.90                                |                                                |
| SKFM16200C-D2 | 200                                   | 140                                   | 200                                 | 0.92                                |                                                |

\*1 Repetitive peak reverse voltage

\*2 RMS voltage

\*3 Continuous reverse voltage

\*4 Maximum forward voltage@ $I_F = 8.0\text{A}$

## Rating and characteristic curves (SKFM1620C-D2 THRU SKFM16200C-D2)

FIG.1-TYPICAL FORWARD CURRENT DERATING CURVE

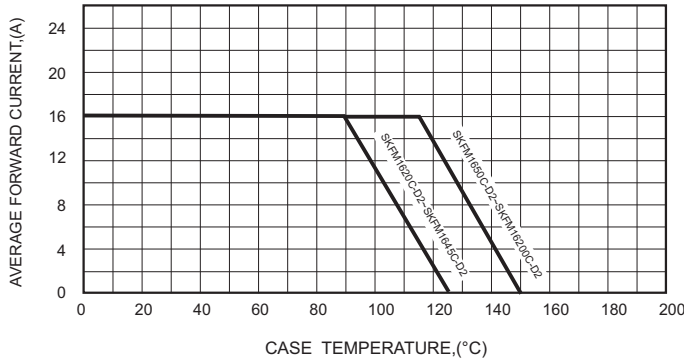


FIG.3-MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT

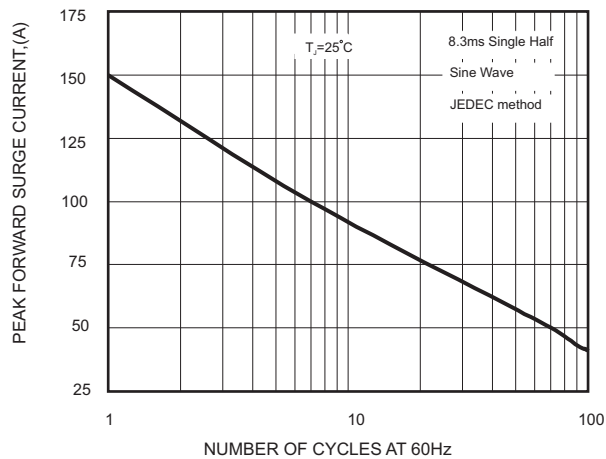


FIG.2-TYPICAL FORWARD CHARACTERISTICS

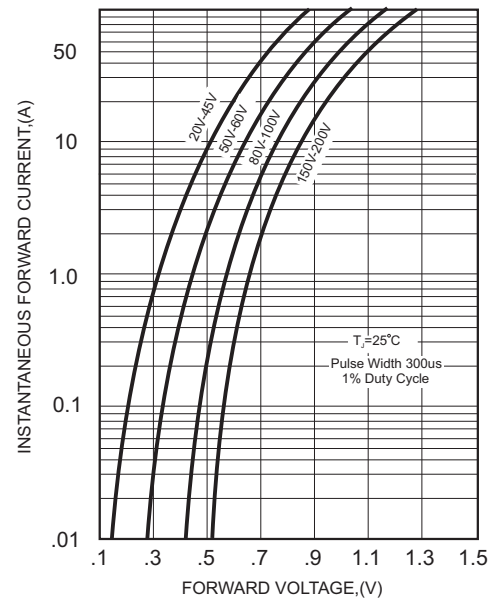
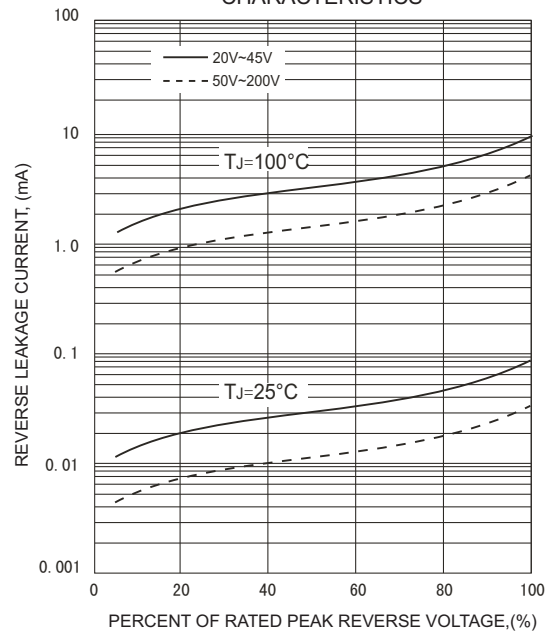
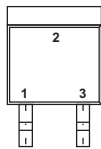
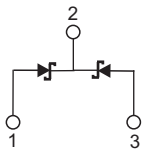


FIG.4- TYPICAL REVERSE CHARACTERISTICS



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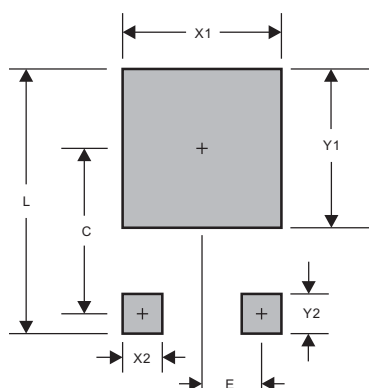
## Pinning information

| Simplified outline                                                                | Symbol                                                                            |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|  |  |

## Marking

| Type number   | Marking code |
|---------------|--------------|
| SKFM1620C-D2  | SK1620       |
| SKFM1630C-D2  | SK1630       |
| SKFM1640C-D2  | SK1640       |
| SKFM1645C-D2  | SK1640       |
| SKFM1650C-D2  | SK1650       |
| SKFM1660C-D2  | SK1660       |
| SKFM1680C-D2  | SK1680       |
| SKFM16100C-D2 | SK16100      |
| SKFM16150C-D2 | SK16150      |
| SKFM16200C-D2 | SK16200      |

## Suggested solder pad layout

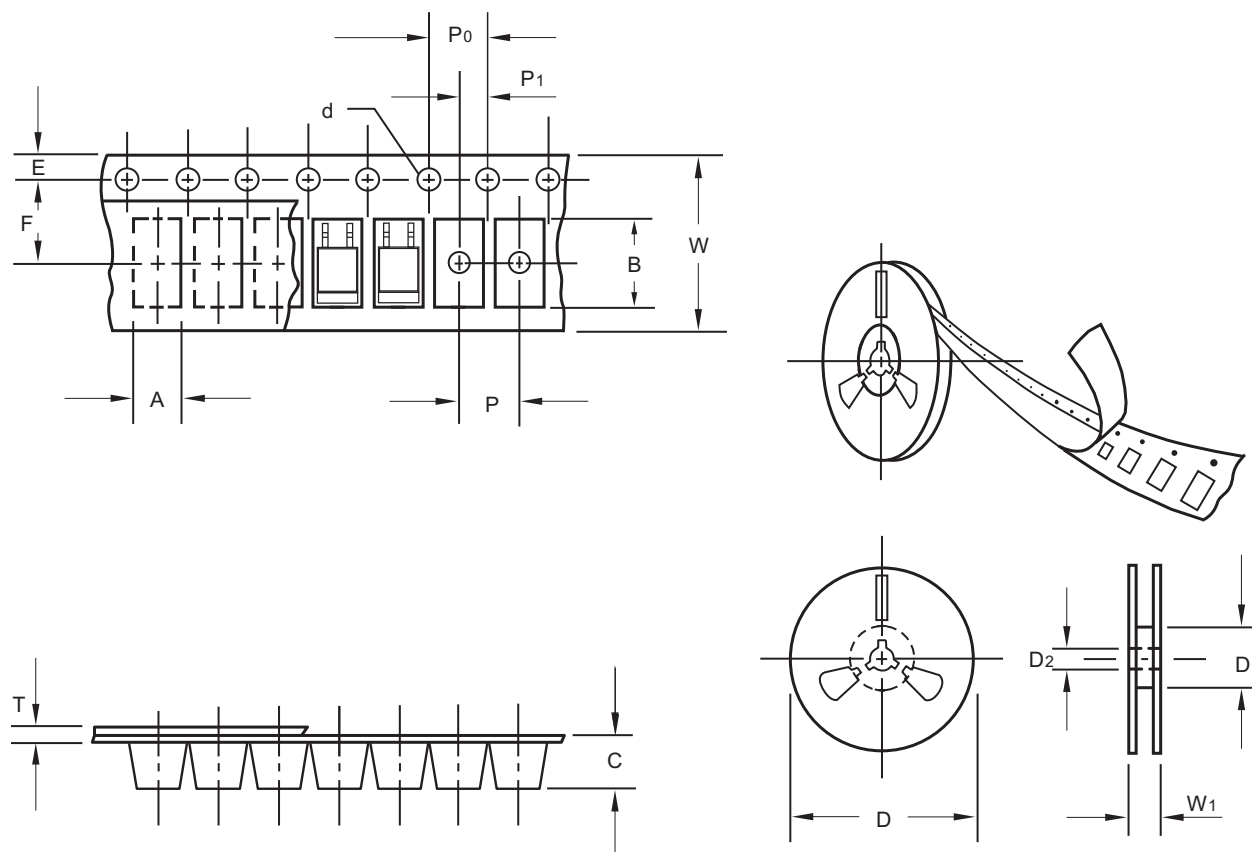


| PACKAGE | D2PAK        |
|---------|--------------|
| C       | 0.374(9.50)  |
| E       | 0.098(2.50)  |
| L       | 0.665(16.90) |
| X1      | 0.425(10.80) |
| X2      | 0.071(1.80)  |
| Y1      | 0.449(11.40) |
| Y2      | 0.138(3.50)  |

Dimensions in inches and (millimeters)

## SKFM1620C-D2 THRU SKFM16200C-D2

## Packing information



unit:mm

| Item                      | Symbol | Tolerance | D2PAK  |
|---------------------------|--------|-----------|--------|
| Carrier width             | A      | 0.1       | 10.70  |
| Carrier length            | B      | 0.1       | 16.30  |
| Carrier depth             | C      | 0.1       | 5.10   |
| 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       | -      |
| 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       | 11.50  |
| Punch hole pitch          | P      | 0.1       | 16.00  |
| 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       | 24.00  |
| Reel width                | W1     | 1.0       | 30.00  |

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

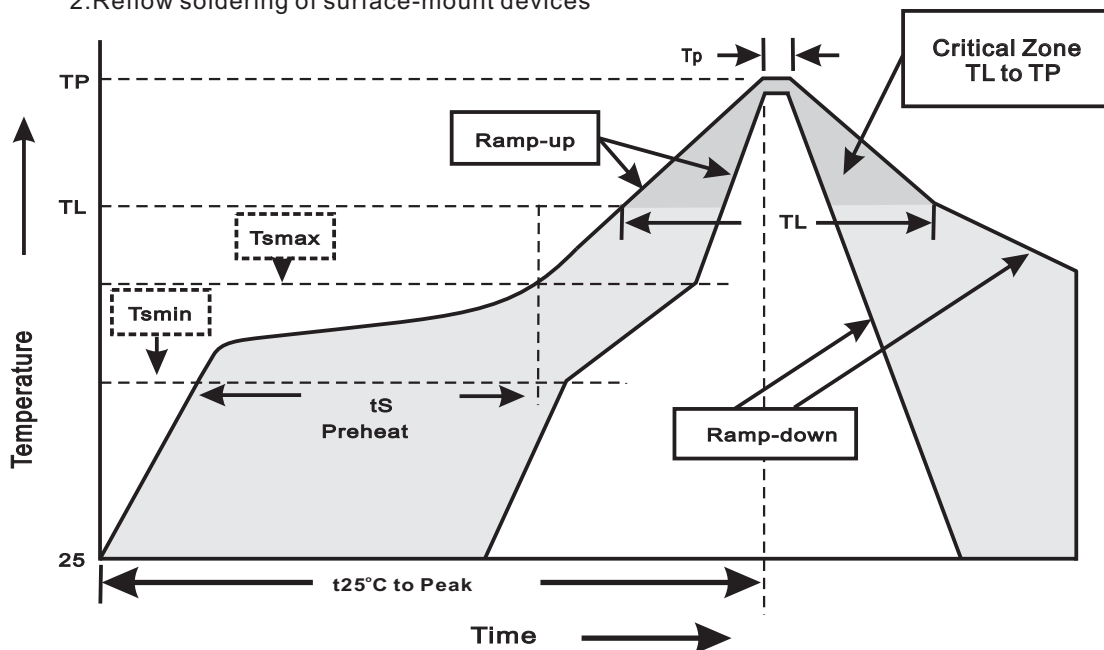
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## Reel packing

| 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) |
|--------------|-----------|------------|-------------------------|-----------|-----------------|-----------------|-------------------|--------------|---------------------------|
| D2PAK/TO-263 | 13"       | 800        | 16.0                    | 800       | 337*337*37      | 330             | 350*330*360       | 6,400        | 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( $T_{\text{smmin}}$ )<br>-Temperature Max( $T_{\text{smmax}}$ )<br>-Time(min to max)( $t_s$ ) | 150°C<br>200°C<br>60~120sec     |
| $T_{\text{smmax}}$ 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                                                                                                            | $<3^{\circ}\text{C}/\text{sec}$ |
| Time 25°C to Peak Temperature                                                                                             | $<6\text{minutes}$              |

**SKFM1620C-D2 THRU SKFM16200C-D2****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-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 $175^{\circ}\text{C}$ for 1000 hrs.                                                                                                     | MIL-STD-750D<br>METHOD-1031   |