

SKFM2020C-D2 THRU SKFM20200C-D2

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20.0A Surface Mount Schottky Barrier Rectifiers - 20V-200V

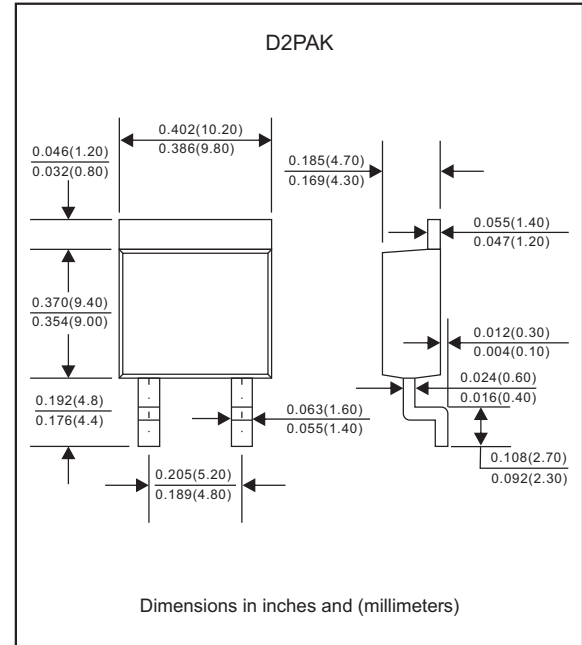
Features

- 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. SKFM2020C-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 (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			20.0	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	
Thermal resistance	Junction to ambient	$R_{\theta JA}$		20		$^{\circ}\text{C/W}$
	Junction to case	$R_{\theta JC}$		5.0		$^{\circ}\text{C/W}$
Storage temperature		T_{STG}	-65		+175	$^{\circ}\text{C}$

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

SYMBOLS	V_{RRM}^{*1} (V)	V_{RMS}^{*2} (V)	V_R^{*3} (V)	V_F^{*4} (V)	Operating temperature $T_J, (^{\circ}\text{C})$
SKFM2020C-D2	20	14	20	0.55	-55 to +125
SKFM2030C-D2	30	21	30		
SKFM2040C-D2	40	28	40		
SKFM2045C-D2	45	31.5	45	0.70	-55 to +150
SKFM2050C-D2	50	35	50		
SKFM2060C-D2	60	42	60	0.85	-55 to +150
SKFM2080C-D2	80	56	80		
SKFM20100C-D2	100	70	100		
SKFM20150C-D2	150	105	150		
SKFM20200C-D2	200	140	200	0.92	

- *1 Repetitive peak reverse voltage
- *2 RMS voltage
- *3 Continuous reverse voltage
- *4 Maximum forward voltage@ $I_F = 10.0\text{A}$

Rating and characteristic curves (SKFM2020C-D2 THRU SKFM20200C-D2)

FIG.1-TYPICAL FORWARD CURRENT DERATING CURVE

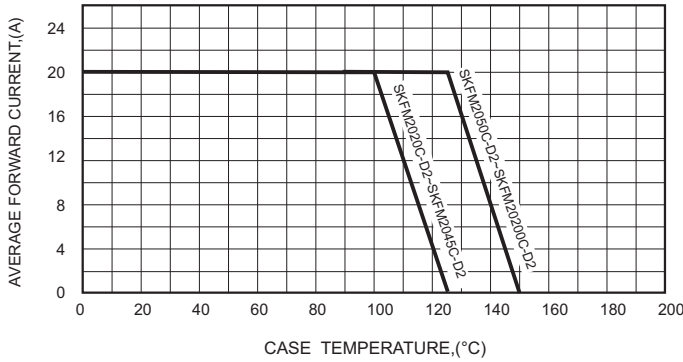


FIG.2-TYPICAL FORWARD CHARACTERISTICS

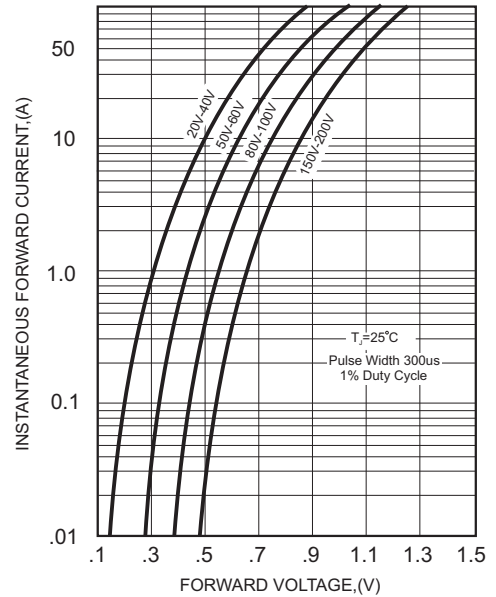


FIG.3-MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT

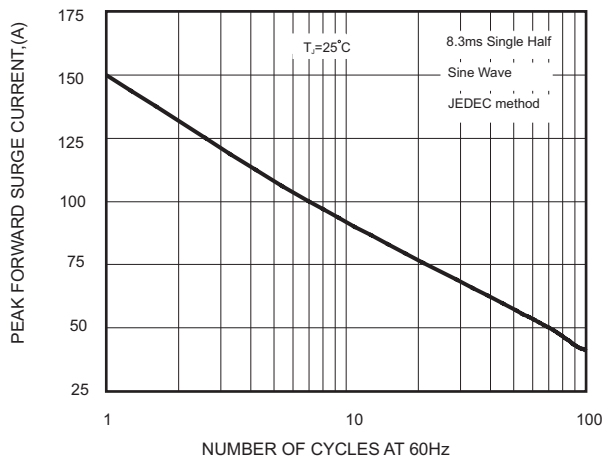


FIG.4- TYPICAL REVERSE CHARACTERISTICS

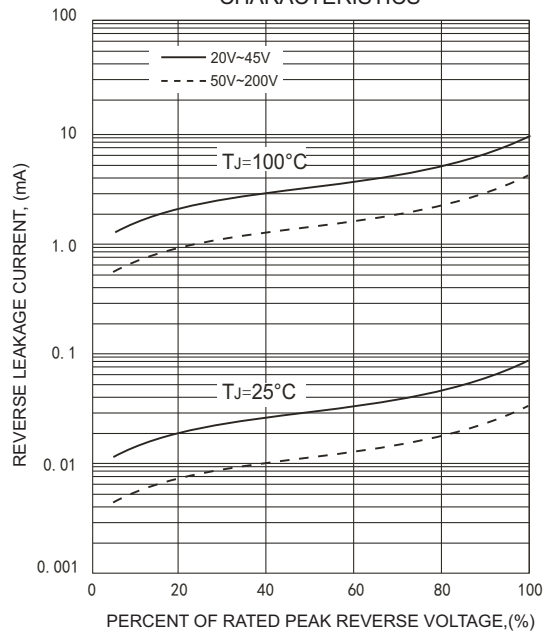
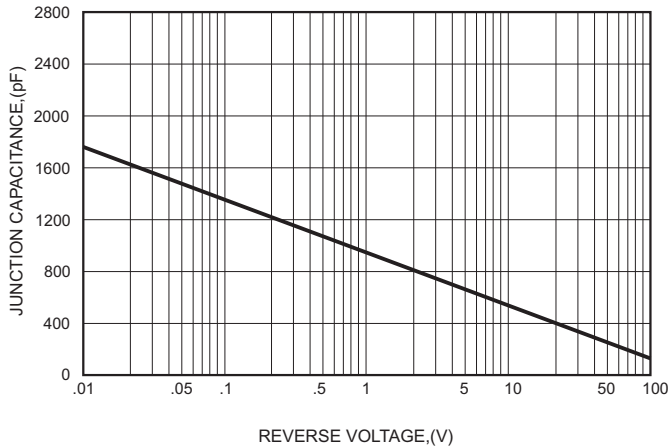
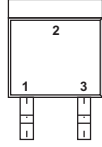
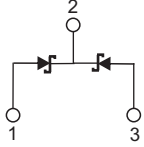


FIG.5-TYPICAL JUNCTION CAPACITANCE



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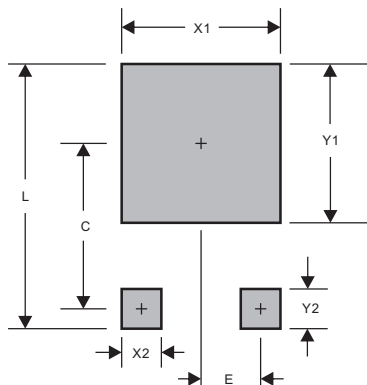
Pinning information

Simplified outline	Symbol
	

Marking

Type number	Marking code
SKFM2020C-D2	SK2020
SKFM2030C-D2	SK2030
SKFM2040C-D2	SK2040
SKFM2045C-D2	SK2045
SKFM2050C-D2	SK2050
SKFM2060C-D2	SK2060
SKFM2080C-D2	SK2080
SKFM20100C-D2	SK20100
SKFM20150C-D2	SK20150
SKFM20200C-D2	SK20200

Suggested solder pad layout

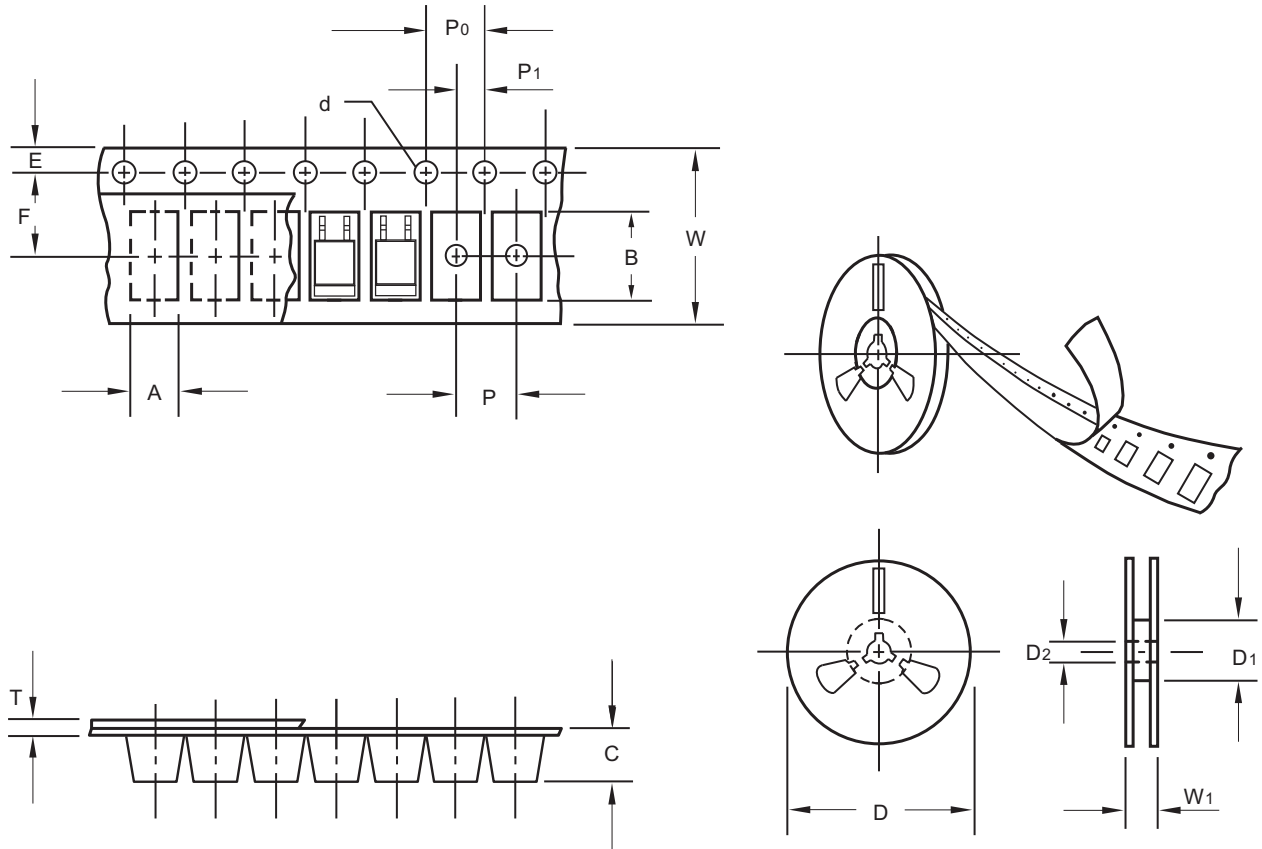


PACKAGE	D2PAK
C	0.374(9.50)
E	0.098(2.50)
L	0.665(16.90)
X1	0.425(10.80)
X2	0.071(1.80)
Y1	0.449(11.40)
Y2	0.138(3.50)

Dimensions in inches and (millimeters)

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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.

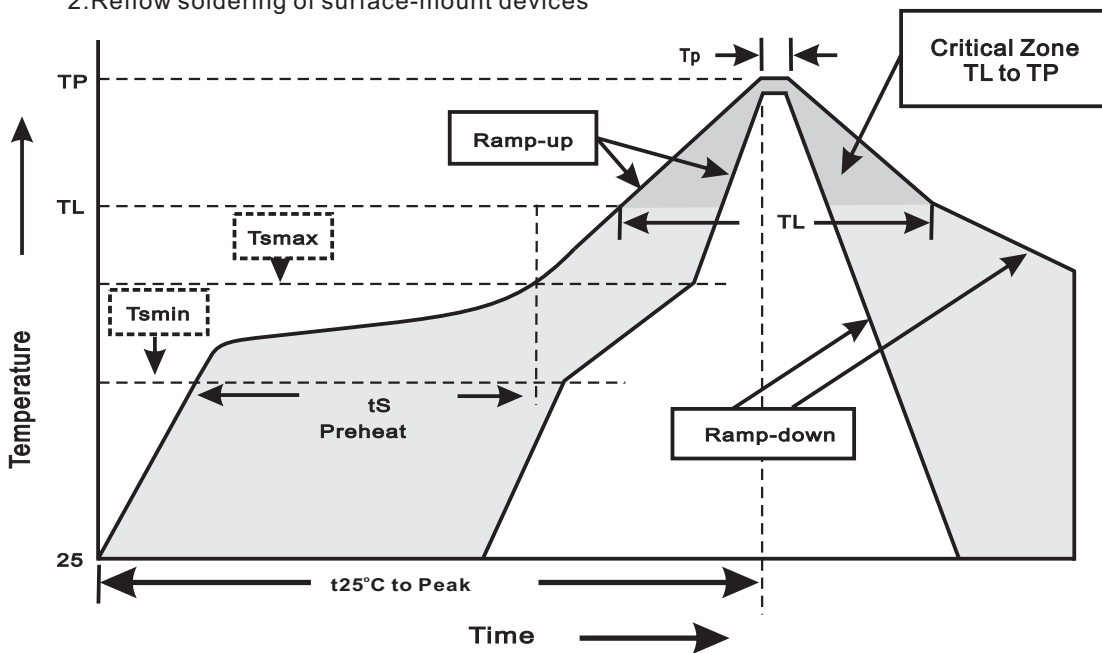
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Reel packing

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	335*335*38	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°C/sec
Preheat -Temperature Min(T _{smmin}) -Temperature Max(T _{smmax}) -Time(min to max)(t _s)	150°C 200°C 60~120sec
T _{smmax} to T _L -Ramp-upRate	<3°C/sec
Time maintained above: -Temperature(T _L) -Time(t _L)	217°C 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°C/sec
Time 25°C to Peak Temperature	<6minutes

SKFM2020C-D2 THRU SKFM20200C-D2**High reliability test capabilities**

Item Test	Conditions	Reference
1. Solder Resistance	at 260±5°C for 10±2sec.	MIL-STD-750D METHOD-2031
2. Solderability	at 245±5°C for 5 sec.	MIL-STD-202F METHOD-208
3. High Temperature Reverse Bias	$V_R=80\%$ rate at $T_J=125^\circ\text{C}$ for 168 hrs.	MIL-STD-750D METHOD-1038
4. Forward Operation Life	Rated average rectifier current at $T_A=25^\circ\text{C}$ for 500hrs.	MIL-STD-750D METHOD-1027
5. Intermittent Operation Life	$T_A = 25^\circ\text{C}$, $I_F = I_o$ On state: power on for 5 min. off state: power off for 5 min. on and off for 500 cycles.	MIL-STD-750D METHOD-1036
6. Pressure Cooker	$15P_{SIG}$ at $T_A=121^\circ\text{C}$ for 4 hrs.	JESD22-A102
7. Temperature Cycling	-55°C to +125°C dwelled for 30 min. and transferred for 5min. total 10 cycles.	MIL-STD-750D METHOD-1051
8. Forward Surge	8.3ms single half sine-wave , one surge.	MIL-STD-750D METHOD-4066-2
9. Humidity	at $T_A=85^\circ\text{C}$, RH=85% for 1000hrs.	MIL-STD-750D METHOD-1021
10. High Temperature Storage Life	at 175°C for 1000 hrs.	MIL-STD-750D METHOD-1031