

**40Amp. MOS BARRIER RECTIFIER**

# SKM4045CTFP

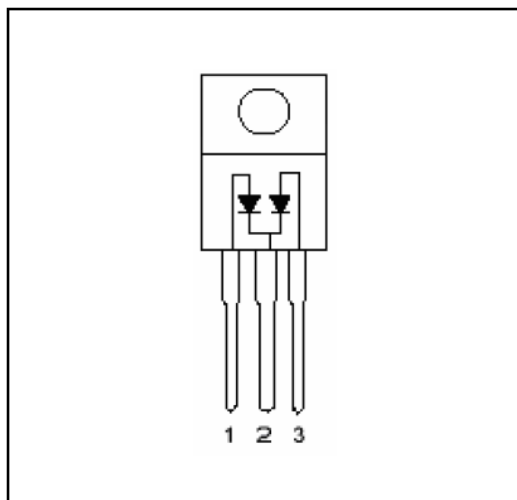
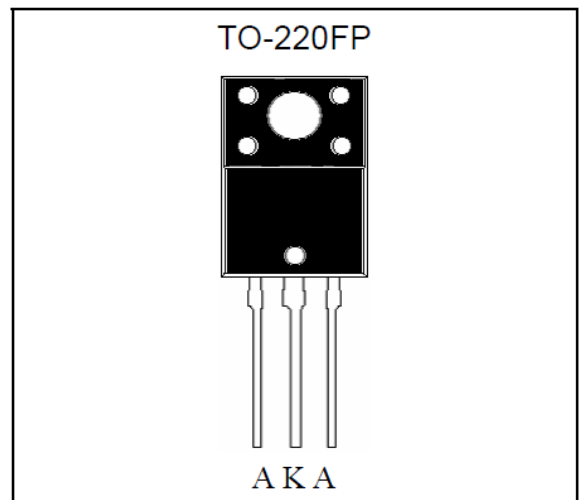
$I_{F(AV)}$	2 x 20A
$V_{RRM}$	45V
$V_F$	0.5V
$T_j$	150°C

**Features**

- 150°C operating junction temperature
- Softest, fast switching capability
- Reduced ultra-low forward voltage drop (VF) ; better efficiency and cooler operation.
- Lead-Free Finish; RoHS Compliant
- Halogen and Antimony Free. “Green” Device
- MCD technology provides a superior avalanche capability than schottky diodes

**Mechanical Data**

- Case: TO-220FP molded plastic
- Weight: 2.2 grams approximately
- Terminals: Pure tin plated, lead-free, solderable per MIL-STD-750 method 2026
- Epoxy: UL 94V-0 rate flame retardant
- Polarity: As marked.

**Equivalent Circuit**

**Outline**


**Maximum Ratings and Electrical Characteristics**

(Rating at 25°C ambient temperature unless otherwise specified. Single phase, half wave, 60Hz, resistive or inductive load. For capacitive load, derate current by 20%.)

Parameter	Symbol	Min.	Typ.	Max.	Units
Maximum DC blocking voltage	V <sub>DC</sub>			45	V
Maximum Recurrent peak reverse voltage	V <sub>RRM</sub>			45	V
Maximum RMS voltage	V <sub>RMS</sub>			32	V
Maximum instantaneous forward voltage at I <sub>F</sub> =20A	V <sub>F</sub>	T <sub>C</sub> =25°C	0.5	0.54	V
		T <sub>C</sub> =125°C	0.48		
Maximum instantaneous reverse current at	I <sub>R</sub>	V <sub>R</sub> =45 V, T <sub>C</sub> =25°C	80	300	μA
		V <sub>R</sub> =45 V, T <sub>C</sub> =125°C	20	50	mA
Maximum Average forward rectified current @ T <sub>C</sub> =100°C	I <sub>F(AV)</sub>			10	A
Non-repetitive peak forward surge current @ 8.3ms single half sine wave superimposed on rated load (JEDEC method)	I <sub>FSM</sub>			280	A
Peak Repetitive Reverse Surge Current (2uS-1Khz)	I <sub>RRM</sub>			2	A
Isolation voltage	V <sub>AC</sub>	1500			V
Maximum Rate of Voltage Change ( at Rated VR )	dv/dt			10000	V/uS
Storage temperature range	T <sub>stg</sub>	-55		150	°C
Operating junction temperature range	T <sub>J</sub>	-55		150	°C

**Thermal Data**

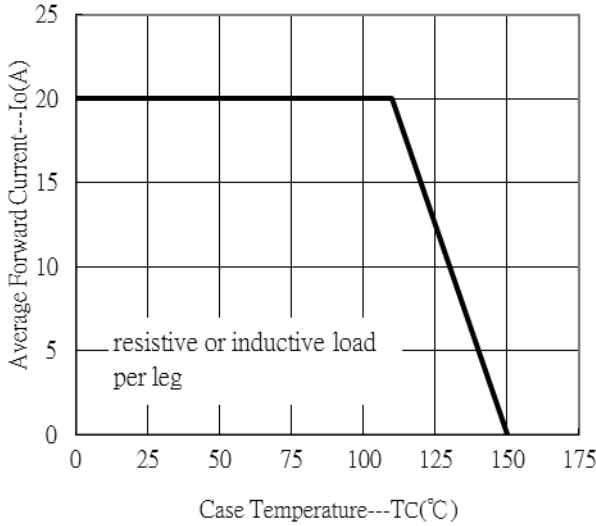
Parameter	Symbol	Value	Unit
Typical Thermal Resistance, Junction-to-case	R <sub>th,j-c</sub>	7	°C/W

**Ordering Information**

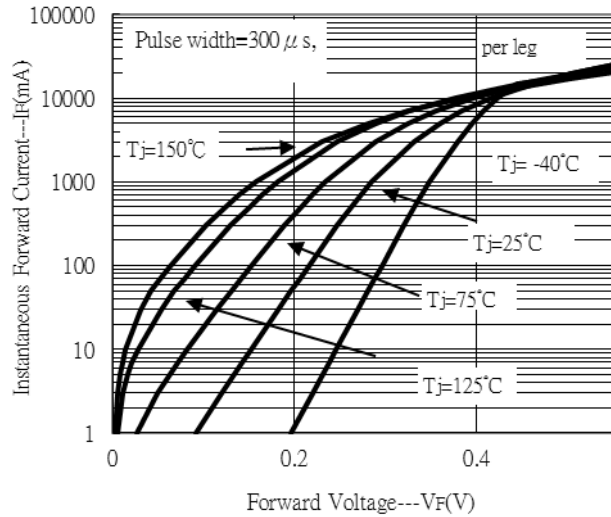
Device	Package	Shipping
SKM4045CTFP	TO-220FP (Pb-free lead plating )	50 pcs/tube, 20tubes/box, 4boxes/carton

## Typical Characteristics

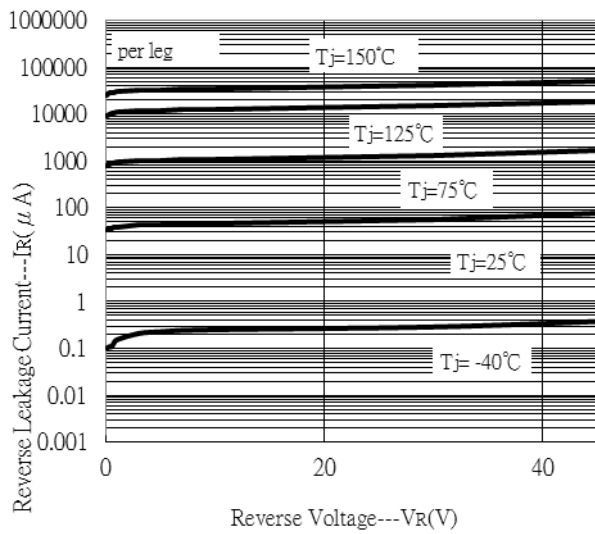
Forward Current Derating Curve



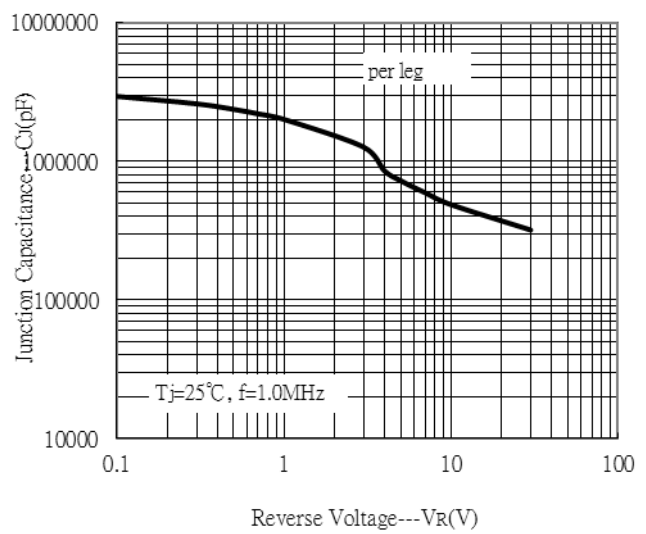
Forward Current vs Forward Voltage



Reverse Leakage Current vs Reverse Voltage



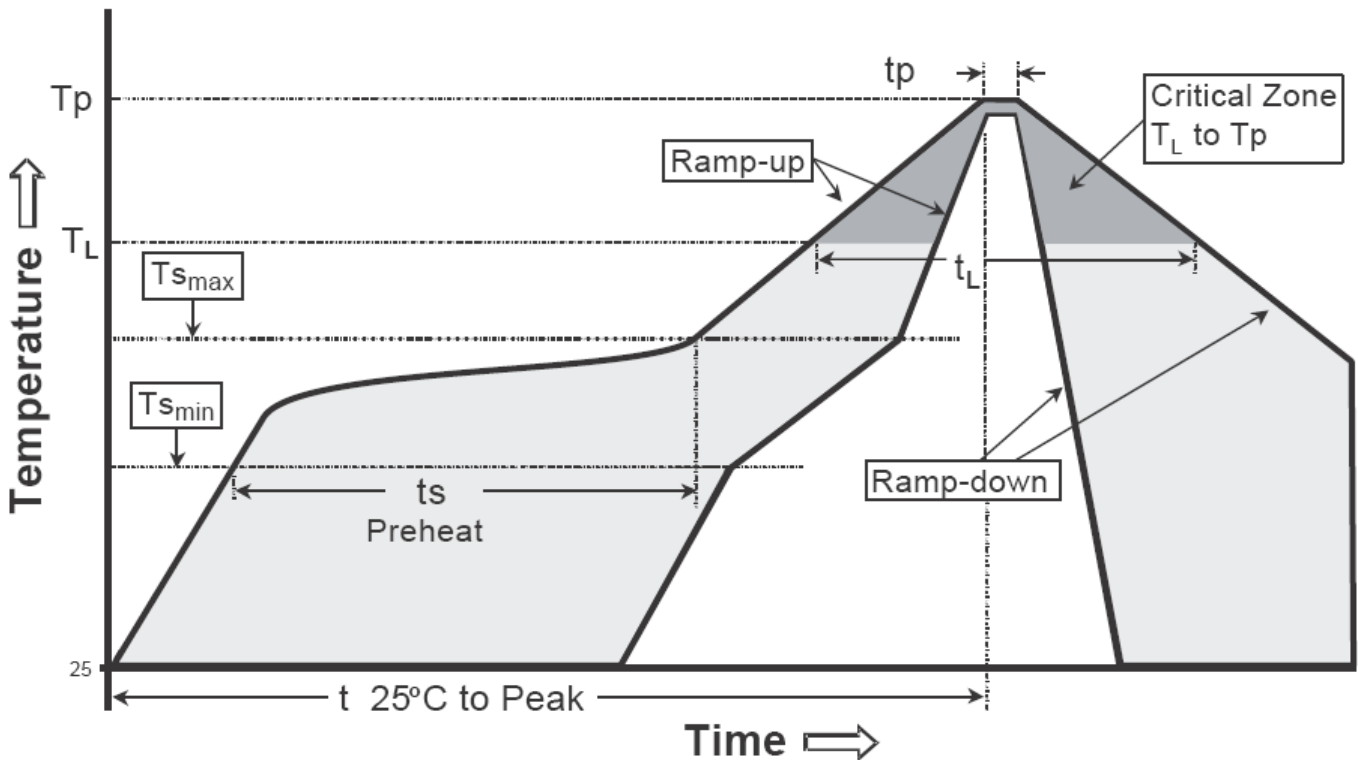
Junction Capacitance vs Reverse Voltage



**Recommended wave soldering condition**

Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

**Recommended temperature profile for IR reflow**



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(Ts min)	100°C	150°C
-Temperature Max(Ts max)	150°C	200°C
-Time(ts min to ts max)	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (TL)	183°C	217°C
- Time (tL)	60-150 seconds	60-150 seconds
Peak Temperature(TP)	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature(tp)	10-30 seconds	20-40 seconds
Ramp down rate	6°C/second max.	6°C/second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

Note : All temperatures refer to topside of the package, measured on the package body surface.

## TO-220FP Dimension

**3-Lead TO-220FP Plastic Package**  
 CYStek Package Code: FP

**Marking:**

Device Name → **CYS M4045**  
 Date Code → □ □

Style: Pin 1.Anode 2.Cathode 3.Anode

\*Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.171	0.183	4.35	4.65	G	0.246	0.258	6.25	6.55
A1	0.051 REF		1.300 REF		H	0.138	REF	3.50	REF
A2	0.112	0.124	2.85	3.15	H1	0.055	REF	1.40	REF
A3	0.102	0.110	2.60	2.80	H2	0.256	0.272	6.50	6.90
b	0.020	0.030	0.50	0.75	J	0.031	REF	0.80	REF
b1	0.031	0.041	0.80	1.05	K	0.020		0.50	REF
b2	0.047	REF	1.20	REF	L	1.102	1.118	28.00	28.40
c	0.020	0.030	0.500	0.750	L1	0.043	0.051	1.10	1.30
D	0.396	0.404	10.06	10.26	L2	0.036	0.043	0.92	1.08
E	0.583	0.598	14.80	15.20	M	0.067	REF	1.70	REF
e	0.100 *		2.54*		N	0.012	REF	0.30	REF
F	0.106	REF	2.70	REF					

Notes: 1.Controlling dimension: millimeters.  
 2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.  
 3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

**Material:**

- Lead: Pure tin plated.
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0.

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