

# 10Amp. MOS BARRIER RECTIFIER

# SKM1045USP

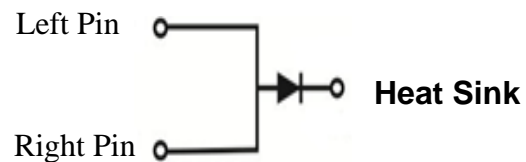
$I_{F(AV)}$	10A
$V_{RRM}$	45V
$V_{F(Max)}$	0.47V
$T_j$	150°C

## 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

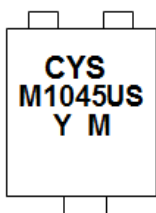
- Case: TO-277 molded plastic
- Mounting Position: Any
- Weight: 0.093 grams (approximate)
- Terminals: Pure tin plated, solderable per JESD22-B102
- Epoxy: UL 94V-0 rate flame retardant
- Polarity : As marked.



## Ordering Information

Device	Package	Shipping
SKM1045USP	TO-277 (RoHS compliant package)	5000/Tape & Reel

## Marking Information



CYS= Manufacturers' Code Marking  
 M1045US = Product Type Marking Code  
 Y M = Date Code Marking  
 Y = Last One Digits of Year (ex: 4 for 2014)  
 M = Month code (01 - 12)

**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>R<sub>RRM</sub></sub>			45	V
Maximum RMS voltage	V <sub>RMS</sub>			32	V
Maximum instantaneous forward voltage at I <sub>F</sub> =10A	V <sub>F</sub>	T <sub>C</sub> =25°C	0.44	0.47	v
		T <sub>C</sub> =125°C	0.39		
Maximum instantaneous reverse current at	I <sub>R</sub>	V <sub>R</sub> =45 V, T <sub>C</sub> =25°C		300	μA
		V <sub>R</sub> =45 V, T <sub>C</sub> =125°C		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>			250	A
Peak Repetitive Reverse Surge Current (2uS-1Khz)	I <sub>RRM</sub>			2	A
Maximum Rate of Voltage Change ( at Rated V <sub>R</sub> )	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
Maximum Thermal Resistance, Junction-to-ambient(1)	R <sub>th,j-a</sub>	73	°C/W
Maximum Thermal Resistance, Junction-to-ambient(2)	R <sub>th,j-a</sub>	31	°C/W

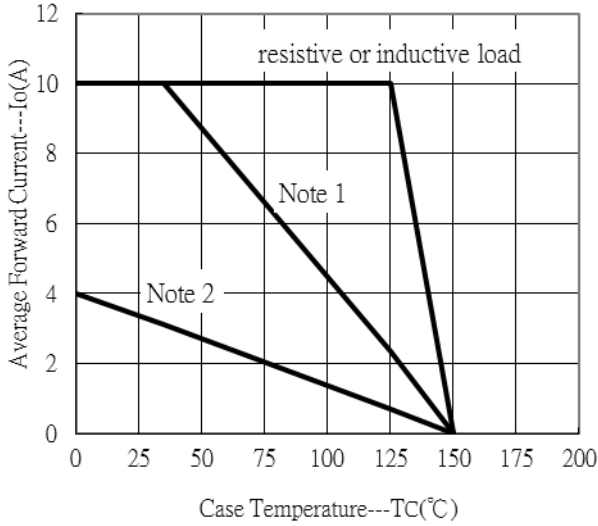
Note

1. FR-4 PCB, 2oz. Copper. Minimum recommended pad layout.

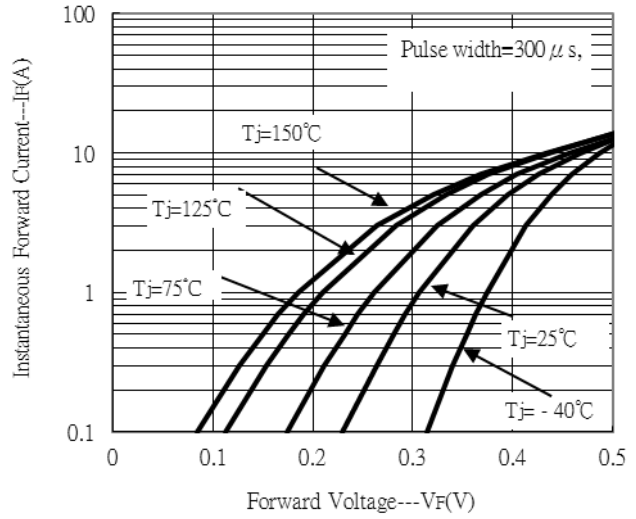
2. Polyimide PCB, 2oz. Copper. Cathode pad dimensions 18.8mm x 14.4mm. Anode pad dimensions 5.6mm x 14.4mm

## Typical Characteristics

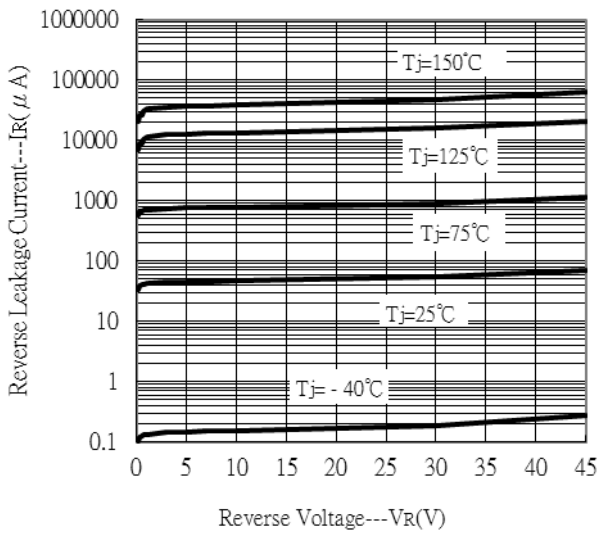
Forward Current Derating Curve



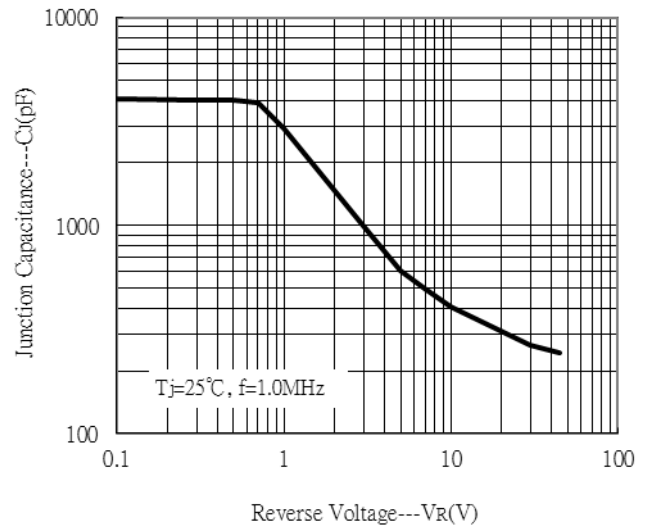
Forward Current vs Forward Voltage



Reverse Leakage Current vs Reverse Voltage



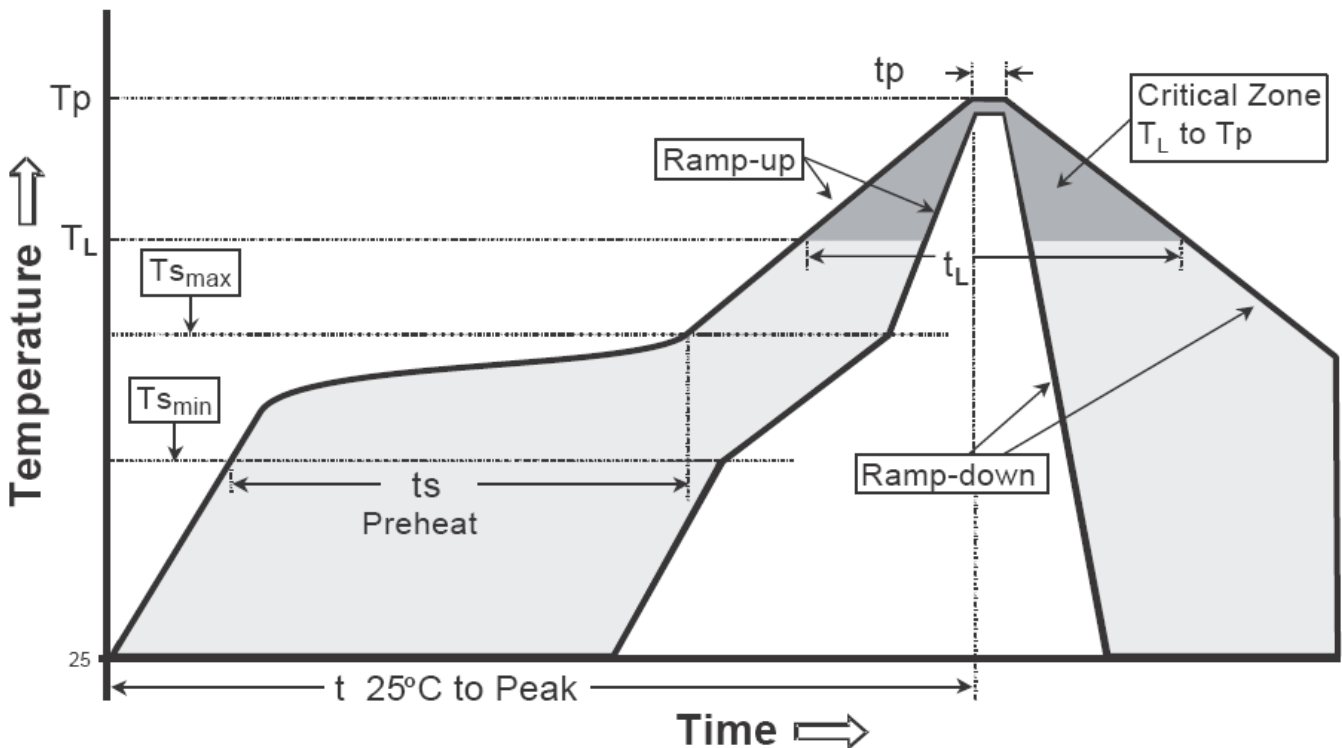
Junction Capacitance vs Reverse Voltage



**Recommended wave soldering condition**

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

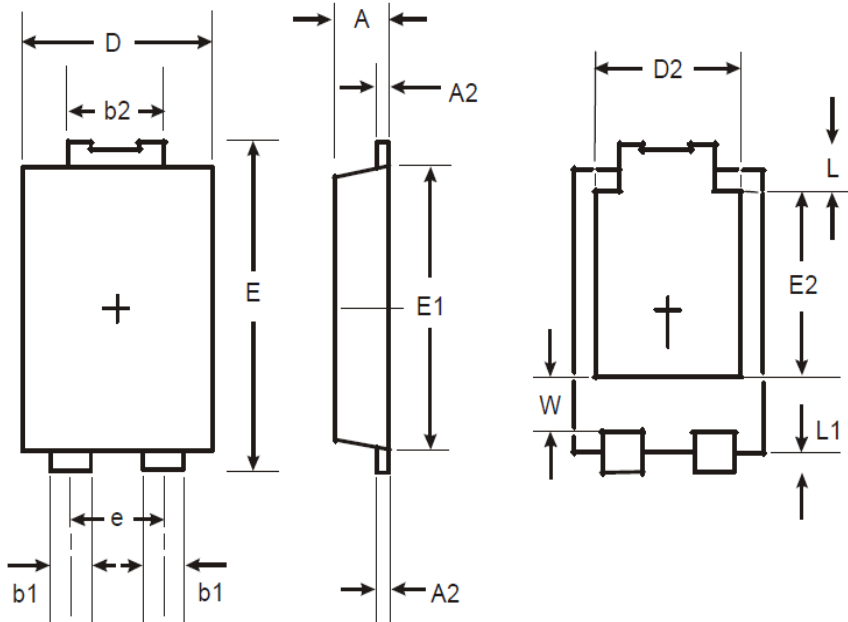
**Recommended temperature profile for IR reflow**



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (T <sub>smax</sub> to T <sub>p</sub> )	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(T <sub>s min</sub> )	100°C	150°C
-Temperature Max(T <sub>s max</sub> )	150°C	200°C
-Time(t <sub>s min</sub> to t <sub>s max</sub> )	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (T <sub>L</sub> )	183°C	217°C
- Time (t <sub>L</sub> )	60-150 seconds	60-150 seconds
Peak Temperature(T <sub>P</sub> )	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature(t <sub>p</sub> )	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.

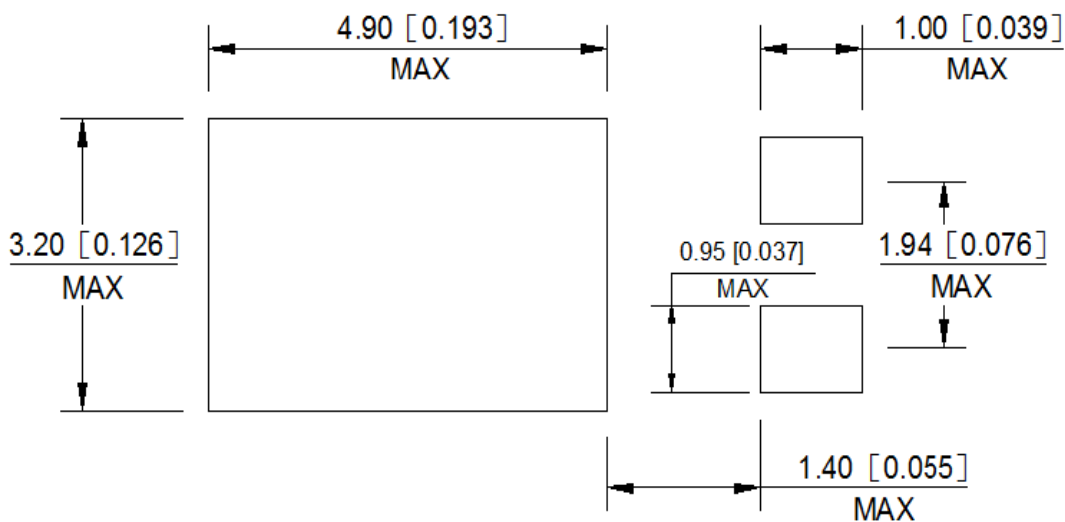
Note : All temperatures refer to topside of the package, measured on the package body surface.

**TO-277 Dimension**

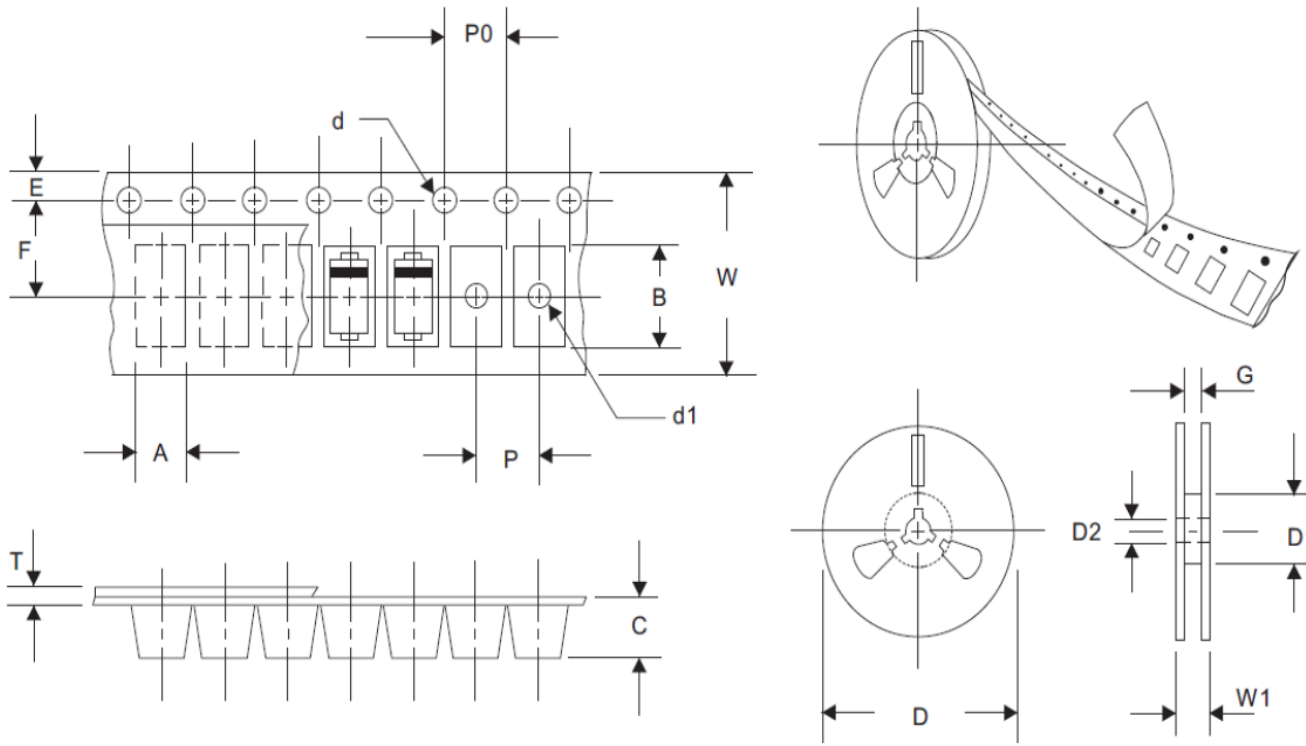


TO277		
Dim	Min	Max
A	0.95	1.25
A2	0.2	0.3
b1	0.85	0.95
b2	1.7	1.9
D	3.88	4.08
D2	2.9	3.2
E	6.3	6.7
e	1.74	1.94
E1	5.28	5.48
E2	3.4	3.7
L	0.7	1
L1	0.5	0.75
W	1.1	1.4
All Dimensions in mm		

**Mounting Pad Layout**



**Packing Information**



W	A	B	C	d1	d	E	F	P	P0	T	D	D1	D2	G	W1
16	4.38	6.9	1.4	1.5	1.5	1.75	7.5	8	4	0.34	330	100	13	16	20

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