

Silicon Flip Chip PIN Diode

Rev. V6

Features

Low Series Resistance : 1.7ΩLow Capacitance : 50fF

- Fast Switching Speed: 20nS
- Silicon Nitride Passivation
- Polyimide Scratch Protection
- Designed for Automated Pick and Place Insertion
- Rugged Design
- RoHS Compliant

Description

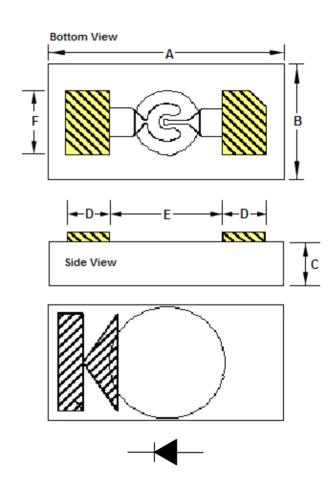
The MA4FCP305 is a silicon flip chip PIN diode fabricated using MACOM's HMIC process. The epitaxial wafers used to fabricated this flip chip are designed for repeatable electrical characteristics and extremely low parasitics. The diode is fully passivated with silicon nitride and also has an additional layer of polyimide for scratch protection. These protective coatings prevent damage to the junction area during manual or automated handling making it suitable for pick and place insertion.

Absolute Maximum Ratings @ T_{AMB} = +25°C (unless otherwise specified)

Parameter	Absolute Maximum			
Forward Current	100 mA			
Reverse Voltage	- 40 V			
Operating Temperature	- 55°C to + 150°C			
Storage Temperature	- 55°C to + 150°C			
Dissipated Power	230 mW			
Mounting Temperature	+300°C for 10 seconds			

1. Exceeding any of these limits may cause permanent damage.

1269 Package Outline



Dim	Inches		Millimeters		
Dim.	Min.	Max.	Min.	Max.	
Α	0.0269	0.0289	0.683	0.733	
В	0.0135	0.0155	0.343	0.393	
С	0.0040	0.0080	0.102	0.203	
D	0.0041	0.0061	0.105	0.155	
Е	0.0124	0.0144	0.315	0.365	
F	0.0069	0.0089	0.175	0.225	

- Yellow hatched areas indicate backside ohmic gold contacts
- 2. Total backside metal thickness 0.1 µm.



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Electrical Specifications @ + 25 °C

Parameters @ Conditions	Symbol	Units	Min.	Тур.	Max.
Total Capacitance @ -10V, 1MHz ¹	Ст	pF		0.060	
Total Capacitance @ -10V, 1GHz ^{1,3}	Ст	pF		0.050	
Series Resistance @ +50mA ^{2,3} , 100MHz	Rs	Ω		1.7	
Series Resistance @ +50mA ^{2,3} , 1GHz	Rs	Ω		2.1	
Forward Voltage @ +100mA	V _F	V		1.05	1.25
Reverse Voltage @ -10μA	V _R	V	-40	-50	
Reverse Current @ -40V	I _R	μΑ			-10
50 – 90 % Lifetime @ + 10mA / - 6mA	TL	ns		25	
Steady State Thermal Resistance ⁴	θ	° C/W		640	

- 1. Total capacitance is equivalent to the sum of junction capacitance Cj and parasitic capacitance, Cp.
- 2. Series resistance R_S is equivalent to the total diode series resistance including the junction resistance R_j.
- 3. Rs and Cp measured on an HP4291A with die mounted in an ODS-186 package.
- Steady-state Thermal Resistance measured with die mounted in an ODS-186 package.

ESD

These devices very susceptible to ESD and are rated Class 0 (0-199V), HBM, per MIL-STD-883, method 3015.7 Although the die are rated Class 0, they must be handled in a dust free, anti-static environment.

Specifications Subject to Change Without Notice.



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Handling Procedures

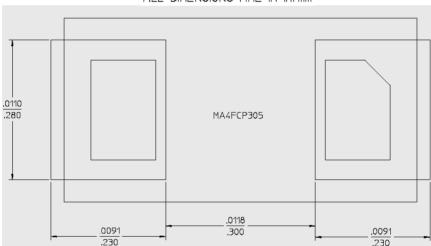
All semiconductor chips should be handled with care to avoid damage or contamination from perspiration and skin oils. The use of plastic tipped tweezers or vacuum pickups is strongly recommended for individual components. Bulk handling should ensure that abrasion and mechanical shock are minimized.

Bonding Techniques

The MA4FCP305 is designed for insertion onto hard or soft substrates with the junction (gold pad) side down. They can be mounted with electrically conductive epoxy or with a low temperature solder preform. However, tin rich solders will scavenge the gold on the surface of the pad or cause gold embrittlement and are not recommended. Indalloy or 80Au/20Sn, solders should be used instead. Maximum soldering temperature must be < 300°C for < 10 seconds. It is recommended that the chips be mounted onto silkscreened circuits using electrically conductive Ag epoxy, approximately 1-2 mils in thickness and cured at approximately 90°C to 150°C per manufacturer's schedule. For extended cure times, > 30 minutes, temperatures must be below 200°C. The die can also be assembled with the junction or contact side up, and wire or ribbon bonds made to the pads.

PCB Footprint





Part Number	Packaging
MA4FCP305	Die in Waffle Pack
MADP-007161-01269T	Tape & Reel

MA4FCP305



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