

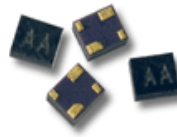
HMPP-3862

Low cost general purpose PIN diode

Description



Lifecycle status: **Active**



Features

The HMPP-386x series of general purpose PIN diodes are designed for two classes of applications. The first is attenuators where current consumption is the most important design consideration. The second application for this series of diodes is in switches where low capacitance with no reverse bias is the driving issue for the designer. VBR=50 V, Ct=0.20 pF, Rs@10mA=3 Ohms, Tau=500 nSec

HMPP-386x Series

MiniPak Surface Mount RF PIN Diodes



Data Sheet

Description/Applications

These ultra-miniature products represent the blending of Avago Technologies' proven semiconductor and the latest in leadless packaging technology.

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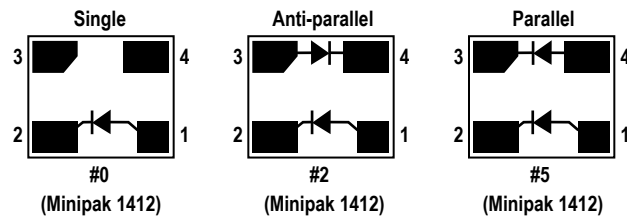
The low dielectric relaxation frequency of the HMPP-386x insures that low capacitance can be reached at zero volts reverse bias at frequencies above 1 GHz, making this PIN diode ideal for hand held applications.

Low junction capacitance of the PIN diode chip, combined with ultra low package parasitics, mean that these products may be used at frequencies which are higher than the upper limit for conventional PIN diodes.

Note that Avago's manufacturing techniques assure that dice packaged in pairs are taken from adjacent sites on the wafer, assuring the highest degree of match.

Minipak 1412 is a ceramic based package, while Minipak QFN is a leadframe based package.

Package Lead Code Identification (Top View)

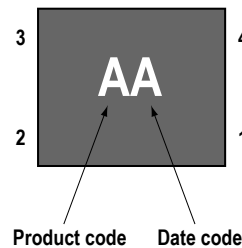


Features

- Surface mount MiniPak package
- Better thermal conductivity for higher power dissipation
- Single and dual versions
- Matched diodes for consistent performance
- Low capacitance at zero volts
- Low resistance
- Low FIT (Failure in Time) rate*
- Six-sigma quality level

* For more information, see the Surface Mount Schottky Reliability Data Sheet.

Pin Connections and Package Marking



Notes:

1. Package marking provides orientation and identification.
2. See "Electrical Specifications" for appropriate package marking.

HMPP-386x Series Absolute Maximum Ratings^[1], T_c = 25°C

Symbol	Parameter	Units	MiniPak 1412 / MiniPak QFN
I _f	Forward Current (1 μs pulse)	Amp	1
P _{IV}	Peak Inverse Voltage	V	100
T _j	Junction Temperature	°C	150
T _{stg}	Storage Temperature	°C	-65 to +150
θ _{jc}	Thermal Resistance ^[2]	°C/W	150

Notes:

1. Operation in excess of any one of these conditions may result in permanent damage to the device.
2. T_c = +25°C, where T_c is defined to be the temperature at the package pins where contact is made to the circuit board.

ESD WARNING:

Handling Precautions Should Be Taken To Avoid Static Discharge.

MiniPak1412

Electrical Specifications, T_c = +25°C, each diode

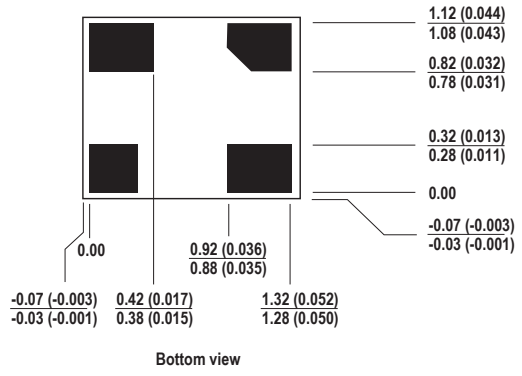
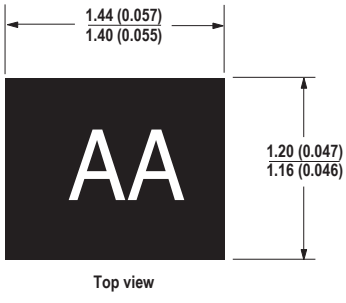
Part Number HMPP-	Package Marking Code	Lead Code	Configuration	Minimum Breakdown Voltage (V)	Typical Series Resistance (Ω)
3860	H	0	Single	50	3.0/1.5*
3862	F	2	Anti-parallel		
3865	E	5	Parallel		
Test Conditions				V _R = V _{BR} Measure I _R ≤ 10 μA	I _F = 10 mA f = 100 MHz *I _F = 100 mA

MiniPak1412

Typical Parameters, T_c = +25°C

Part Number HMPP-	Total Resistance R _T (Ω)	Carrier Lifetime τ (ns)	Reverse Recovery Time T _{rr} (ns)	Total Capacitance C _T (pF)
3860 3862 3865	22	500	80	0.20
Test Conditions	I _F = 1 mA f = 100 MHz	I _F = 50 mA T _R = 250 mA	V _R = 10 V I _F = 20 mA 90% Recovery	V _R = 50 V f = 1 MHz

MiniPak 1412 Outline Drawing



Dimensions are in millimeters (inches)

Assembly Information

The MiniPak diode is mounted to the PCB or microstrip board using the pad pattern shown in Figure 17.

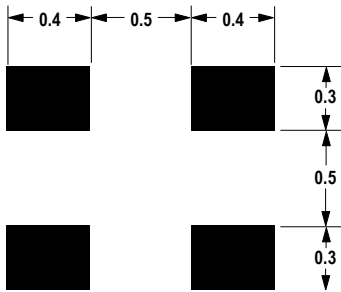


Figure 12. PCB Pad Layout, MiniPak (dimensions in mm).

This mounting pad pattern is satisfactory for most applications. However, there are applications where a high degree of isolation is required between one diode and the other is required. For such applications, the mounting pad pattern of Figure 18 is recommended.

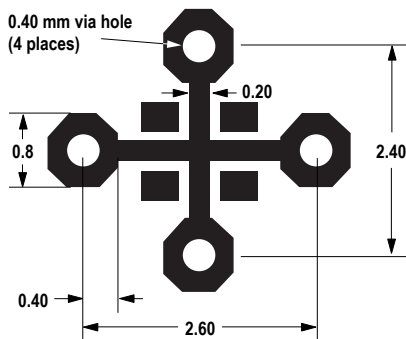


Figure 13. PCB Pad Layout, High Isolation MiniPak (dimensions in mm).

This pattern uses four via holes, connecting the crossed ground strip pattern to the ground plane of the board.

SMT Assembly

Reliable assembly of surface mount components is a complex process that involves many material, process, and equipment factors, including: method of heating (e.g., IR or vapor phase reflow, wave soldering, etc.) circuit board material, conductor thickness and pattern, type of solder alloy, and the thermal conductivity and thermal mass of components. Components with a low mass, such as the MiniPak package, will reach solder reflow temperatures faster than those with a greater mass.

After ramping up from room temperature, the circuit board with components attached to it (held in place with solder paste) passes through one or more preheat zones. The preheat zones increase the temperature of the board and components to prevent thermal shock and begin evaporating solvents from the solder paste. The reflow zone briefly elevates the temperature sufficiently to produce a reflow of the solder.

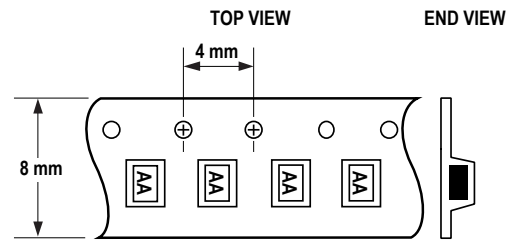
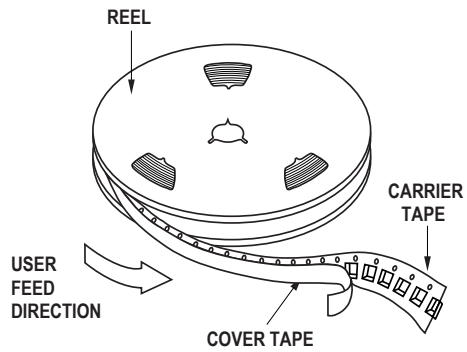
The rates of change of temperature for the ramp-up and cool-down zones are chosen to be low enough to not cause deformation of the board or damage to components due to thermal shock. The maximum temperature in the reflow zone (T_{MAX}) should not exceed 260°C.

These parameters are typical for a surface mount assembly process for Avago diodes. As a general guideline, the circuit board and components should be exposed only to the minimum temperatures and times necessary to achieve a uniform reflow of solder.

Ordering Information

Part Number	No. of Devices	Container
HMPP-386x-TR2	10000	13" Reel
HMPP-386x-TR1	3000	7" Reel
HMPP-386x-BLK	100	antistatic bag

Device Orientation



Note: "AA" represents package marking code. Package marking is right side up with carrier tape perforations at top. Conforms to Electronic Industries RS-481, "Taping of Surface Mounted Components for Automated Placement." Standard quantity is 3,000 devices per reel.