

Features

- Fast Switching
- Low Series Resistance
- Low Junction Capacitance
- Low Thermal Resistance
- RoHS* Compliant

Applications

- ISM

Description

The MMP7020 - 40 Series of PIN diodes are fast switching, low series resistance, low capacitance PIN diode chips. These diodes are also available packaged in several other package styles. The low junction capacitance, thin I-layer and low series resistances combine to produce outstanding insertion loss, isolation and switching time. The low thermal resistance enables these devices to safely handle moderately high power signals in high frequency switching applications. This rugged device is capable of reliable operation in all military, commercial and industrial applications.

This series of PIN diodes are designed to be used in moderate peak and average power switch applications which operate at high frequencies and require low switching time. These diodes performs exceptionally well from UHF through microwave frequencies.



Consult Factory for other package styles.

Environmental Capabilities

The MMP7020 - 40 Series of PIN diodes are capable of meeting the environmental requirements of MIL-STD-750 and MIL-STD-883.

Static Sensitivity

These electronic devices are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these (HBM) Class 0 devices.

* Restrictions on Hazardous Substances, compliant to current RoHS EU directive.

Electrical Specifications: $T_A = +25^\circ\text{C}$, Fast Switching, Low Power

Model	Reverse Voltage Breakdown (V_{BR})	Junction Capacitance (C_J)	Minority Carrier Lifetime (T_L)	Theta (θ_{JC})	Switching Speed (TS)	Series Resistance @ 75 mA (R_S)	Series Resistance @ 20 mA (R_S)
	V	pF	ns	$^\circ\text{C/W}$	ns	Ω	Ω
	Min.	Max.	Typ.	Max.	Max.	Max.	Typ.
MMP7020-11	70	0.05	60	80	5	0.9	1.2
MMP7021-11		0.10		70		0.7	1.0
MMP7022-11		0.15		60		0.6	0.9
MMP7023-11		0.20		55		0.5	0.7
MMP7024-11		0.25		50		0.45	0.5
MMP7025-11	100	0.03	100	90	10	1.2	1.9
MMP7026-11		0.07		80		0.9	1.5
MADP-007026-1056B0 ⁶		0.07		80		.85	1.2
MMP7027-11		0.10		70		0.7	1.2
MMP7028-11		0.15		60		0.6	1.0
MMP7029-11		0.20		55		0.5	0.9
MMP7030-11		0.30		50	15	0.45	0.8
MMP7031-11	200	0.06	225	90	15	1.9	3.0
MMP7032-11		0.07		80		1.2	2.2
MMP7033-11	160	0.10		70		1.2	1.6
MMP7034-11	200	0.15		60		0.8	1.0
MMP7035-11		0.20		55		0.7	0.8
MMP7036-11		0.30		50		0.6	0.7
MMP7040-11		0.03	400	65	20	2.6	3.5

- Reverse Breakdown Voltage measured at 10 μA
- Junction Capacitance measured at -10 V, 1 MHz.
- Minority Carrier lifetime measured with $I_F = 10\text{ mA}$, $I_R = 6\text{ mA}$.
- RF Switching speed measured from 90% to 10% and 10% to 90% transmission. Drive output = +20 mA and -4 V, 200 mA spike with a rise time of 2 ns.
- Series Resistance is measured at 1 GHz using transmission loss techniques.
- MADP-007026-1056B0 (ODS-1056 Package) - C_T @ 10 V, F = 1 MHz = 0.2 pF typ.

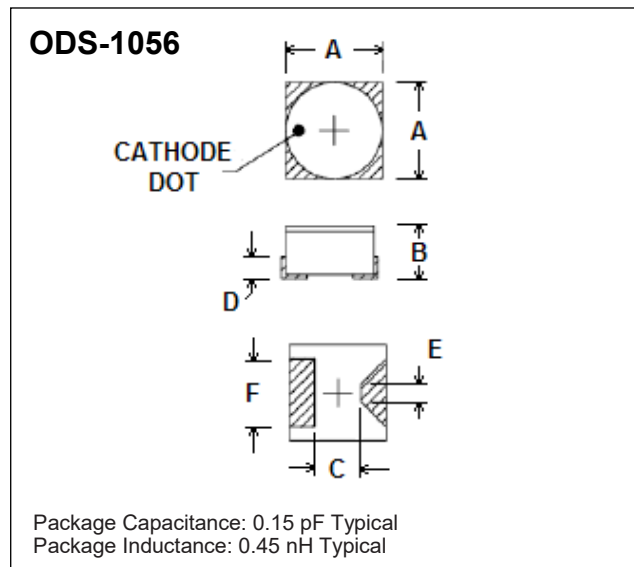
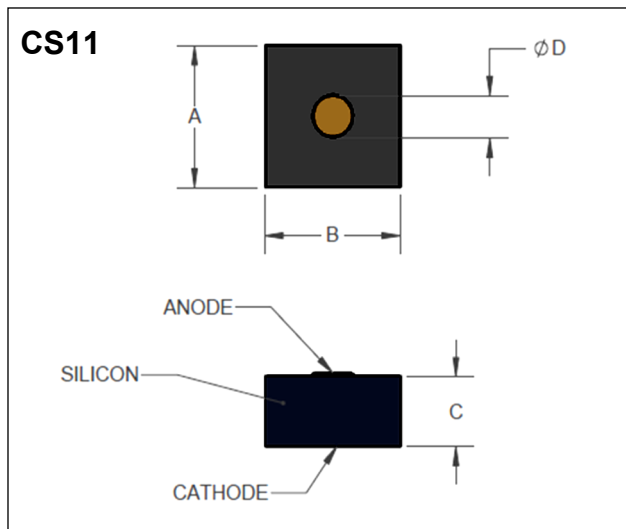
Absolute Maximum Ratings^{7,8}

Parameter	Absolute Maximum
Operating Temperature	-55°C to +150°C
Storage Temperature	-65°C to +200°C
Assembly Temperature ⁹	<300°C for 5 seconds

7. Exceeding any one or combination of these limits may cause permanent damage to the device.
 8. MACOM does not recommend sustained operation near these survivability limits.
 9. MADP-007026-1056B0 (ODS-1056 Package) maximum assembly temperature 200°C.

Assembly Instructions

Die attach of the MMP7020-11 - MMP7040-11 silicon PIN diode chips may be accomplished with conductive epoxy or a eutectic solder such as Au(80%)/Sn(20%) or Au(88%)/Ge(12%). Electrical connection to the cathode may be made with a Au wire or ribbon, utilizing thermo compression or thermosonic bonding. Care should be exercised to not employ excessive pressure or ultrasonic energy while wire/ribbon bonding to avoid physical damage to the die.



Dimensions (inches)

Dimension	Min.	Nom.	Max.
A	0.012	0.013	0.014
B	0.012	0.013	0.014
C	0.004	0.005	0.006
C ¹⁰	0.009	0.010	0.011
C ¹¹	0.0065	0.007	0.008
D	0.003	0.004	0.005
D ¹⁰	0.002	0.0025	0.003
D ¹¹	.0.003	0.0035	0.004

Dimensions (inches)

Dim.	INCHES		MILLIMETERS	
	Min.	Max.	Min.	Max.
A	0.065	0.075	1.65	1.91
B	0.034	0.041	0.86	1.04
C	0.030	0.036	0.76	0.91
D	0.009	0.021	0.23	0.53
E	0.010	0.014	0.25	0.36
F	0.043	0.053	1.09	1.35

10. Dimension for MMP7031-11 only.

11. Dimension for MMP7033-11 only.

MACOM Technology Solutions Inc. ("MACOM"). All rights reserved.

These materials are provided in connection with MACOM's products as a service to its customers and may be used for informational purposes only. Except as provided in its Terms and Conditions of Sale or any separate agreement, MACOM assumes no liability or responsibility whatsoever, including for (i) errors or omissions in these materials; (ii) failure to update these materials; or (iii) conflicts or incompatibilities arising from future changes to specifications and product descriptions, which MACOM may make at any time, without notice. These materials grant no license, express or implied, to any intellectual property rights.

THESE MATERIALS ARE PROVIDED "AS IS" WITH NO WARRANTY OR LIABILITY, EXPRESS OR IMPLIED, RELATING TO SALE AND/OR USE OF MACOM PRODUCTS INCLUDING FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHT, ACCURACY OR COMPLETENESS, OR SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES WHICH MAY RESULT FROM USE OF THESE MATERIALS.

MACOM products are not intended for use in medical, lifesaving or life sustaining applications. MACOM customers using or selling MACOM products for use in such applications do so at their own risk and agree to fully indemnify MACOM for any damages resulting from such improper use or sale.