Control Devices: MMN 7000 Series

Low - High Power NIP Diodes

Description

The **MicroMetrics** MMN 7000 series NIP diodes are manufactured using very high resistivity silicon epitaxial material grown on a highly doped low resistivity substrate. This, combined with a grown junction N++ layer, yields a very abrupt structured I region with minimum outdoping and low voltage punchthrough characteristics.

Our high temperature passivation and state of the art metallization produce diodes that are designed to cover a wide range of applications that fall into the general categories of switching, phase switching, attenuating and limiting. These devices are rugged and able to meet all visual criteria in space and military applications.

Applications

The NIP series are used in switch applications which include high speed low power switches, medium speed higher power switches, high power switches and attenuators, TR switches and digital phase shifters.

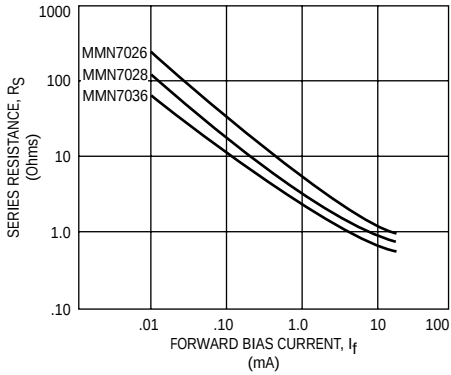
Features

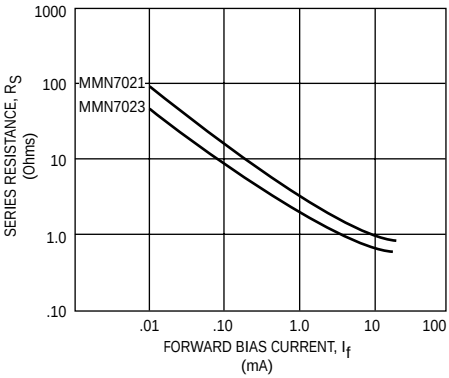
- High Temperature Passivation for Reliability
- Grown Junction for Sharp "I" Region Interface
- Full Area Gold Contact for the Lowest Capacitance and Largest Bonding Pad Available
- Lot Traceability and Lot Control, Assuring High Reproducibility

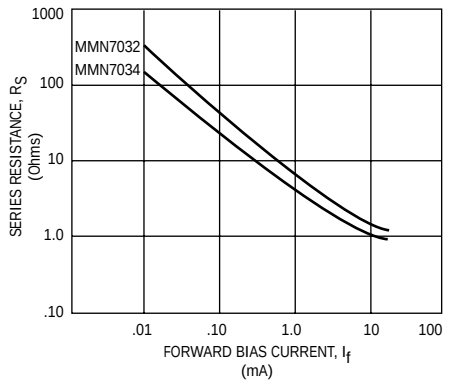
Packaging

- Chip, Glass, Ceramic, Surface Mount

Typical Performance







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Electrical Characteristics

Ultra Fast Switching

V_{br}[1] MIN (V)	Cj-10 V[2] MAX (pF)	T_I[3] TYP (nS)	TS[4] MAX (nS)	R_S[5]@ 50 mA MAX (Ohms)	R_S[5]@ 10 mA TYP (Ohms)	∅jc MAX °C/W	Part Number
25	.15	10	1.5	.55	.8	50	MMN7011
25	.25	10	1.5	.4	.6	35	MMN7013

Fast Switching, Low Power

V_{br}[1] MIN (V)	Cj-10 V[2] MAX (pF)	T_I[3] TYP (nS)	TS[4] MAX (nS)	R_S[5]@ 75 mA MAX (Ohms)	R_S[5]@ 20 mA TYP (Ohms)	∅jc MAX °C/W	Part Number
70	.1	60	5	.7	1.0	70	MMN7021
70	.2	60	5	.5	.7	55	MMN7023
100	.07	100	10	.9	1.5	80	MMN7026
100	.15	100	10	.6	1.0	60	MMN7028
100	.3	100	15	.45	.8	50	MMN7030
200	.07	225	15	1.2	2.2	80	MMN7032
200	.15	225	15	.8	1.0	60	MMN7034
200	.3	225	15	.6	.7	50	MMN7036

Medium Power, General Purpose

V_{br}[1] MIN (V)	Cj-10 V[2] MAX (pF)	T_I[3] TYP (nS)	TS[4] MAX (nS)	R_S[5]@ 100 mA MAX (Ohms)	R_S[5]@ 20 mA TYP (Ohms)	∅jc MAX °C/W	Part Number
200	.07	400	20	1.5	2.2	60	MMN7041
200	.15	400	20	1.0	1.9	50	MMN7043
200	.3	400	20	.7	1.4	40	MMN7045
200	.1	600	25	1.2	2.0	50	MMN7049
200	.2	600	25	.8	1.7	40	MMN7051
200	.5	600	25	.6	1.2	15	MMN7053

Notes:
1. Reverse Breakdown Voltage measured at 10 µA.
2. Junction Capacitance measured at -10 volts at 1 MHz.
3. Minority Carrier lifetime measured with IF = 10 mA, IR = 6mA.
4. RF Switching speed measured from 90% to 10% and 10% to 90% transmission. Drive output = +20 mA and -4 volts, 200 mA spike with a rise time of 2 nS.
5. Series Resistance is measured at 1 GHz using transmission loss techniques.

Maximum Ratings

Operating Temperature	-55°C to 150°C
Storage Temperature	-65°C to 200°C
Reverse Breakdown Voltage (Vbr)	from 25 volts to 500 volts at 10 µA
Junction Capacitance (Cj-10)	from .07 pF to .5 pF at 10 volts
Switching Speed (T_S)	from 1 nS to 25 nS
Lifetime (TI)	from 10 nS to 2.0 µS TYP
Chip Thickness	.004" - .007" thick

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