Diode Limiter using PIN Diode NSDP301MX2W and Schottky Barrier Diode NSR201MX

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Overview

This application note explains about Diode Limiter application using NSDP301MX2W and NSR201MX. NSDP301MX2W is PIN diode with low series resistance and small capacitance. NSR201MX2 is schottky barrier diode with low forward voltage and small capacitance. Both device use 1.0 x 0.6 mm size, X2DFN2 package. These are suitable for high frequency application. For the detail performance, please refer to the datasheet of each product.

This circuit has a circuit configuration in which NSDP301MX2W and NSR201MX are connected in parallel. This application is suitable for attenuating input signals above 10 dBm.

A standard material FR4 is used for the printed circuit board (PCB). Please note that the losses of the PCB and the SMA connector are not excluded.

SUMMARY OF DATA

(T_A = 25°C, Z_O = 50 Ω)

Parameter	Symbol	Condition	Result	Unit
Insertion Loss*	ISL	Pin = −20 dBm, f = 100 MHz	0.15	dB
		Pin = −20 dBm, f = 500 MHz	0.18	
		Pin = −20 dBm, f = 1000 MHz	0.25	
Gain 1 dB Compression Input Power	P1dB	f = 100 MHz	6.3	dB
		f = 500 MHz	7.5	
		f = 1000 MHz	8.8	
Input 3rd Order Intercept Point	IIP3	f = 100 MHz	27.3	dB
		f = 500 MHz	28.2	
		f = 1000 MHz	28.3	
Attenuation @ +10 dBm	ATT	f = 100 MHz	16.5	dB
		f = 500 MHz	17.5	
		f = 1000 MHz	20.5	

*Include Board Loss

Circuit Design

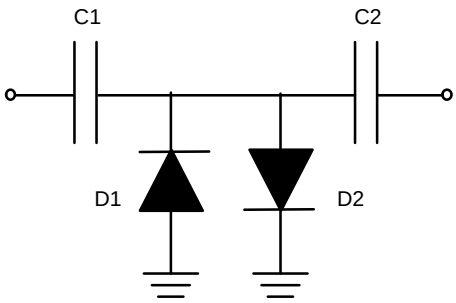

Figure 1. Circuit Design

Evaluation Board

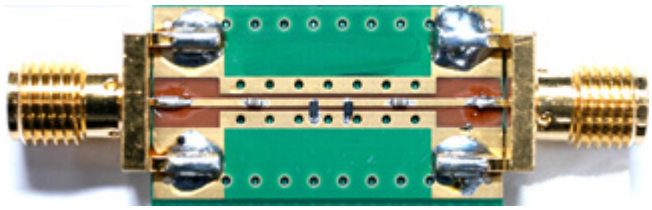

Figure 2. Evaluation Board

BILL OF MATERIALS

Item	Symbol	Value	Manufacturer	Size
PIN diode	D1	NSDP301MX2W	**onsemi**	X2DFNW2 (1006)
Schottky Diode	D2	NSR201MX2	**onsemi**	X2DFN2(1006)
Capacitor	C1, C2	220 pF	Various	1005
Material	–	FR4	–	25 x 14 mm

Power Level

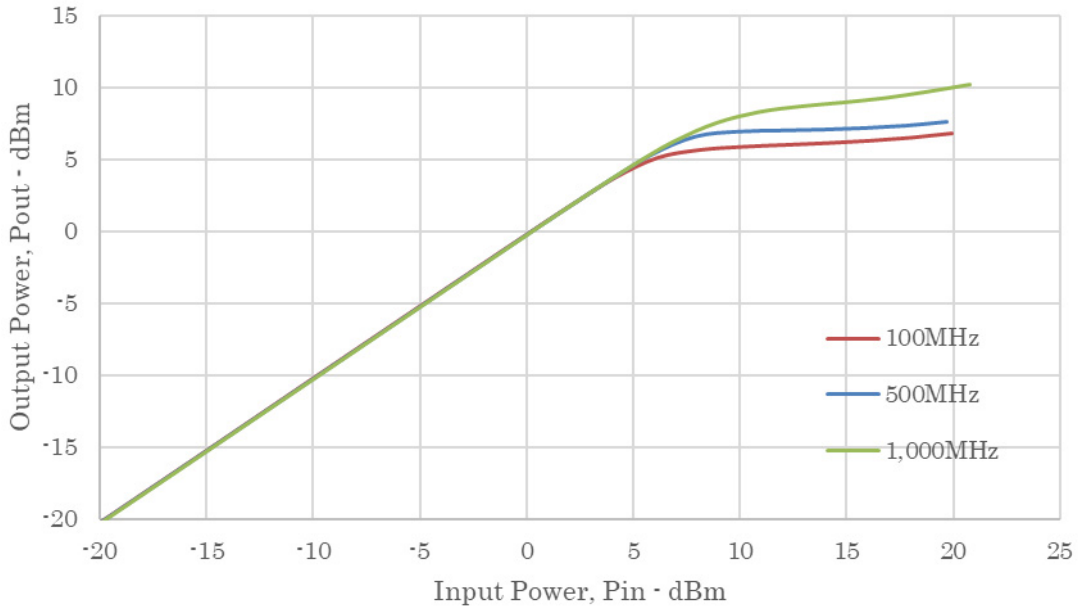

Figure 3. Power Level

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