AND9482/D

Diode Detector Circuit using the NSVR351SDSA3

ON Semiconductor®

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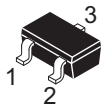
APPLICATION NOTE



SC-59 / CP3

Overview

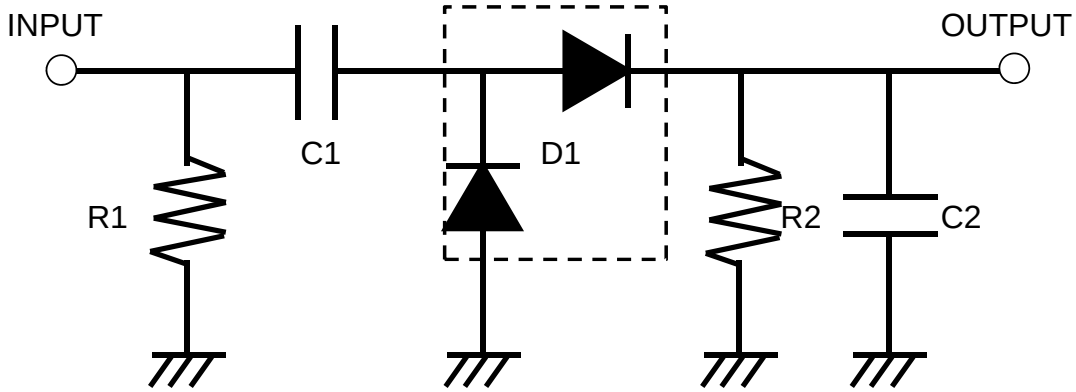
This application note explains about ON Semiconductor's NSVR351SDSA3 which is used as a diode detector circuit.

A Schottky diode is a diode using the schottky barrier generating due to the junction of the metal and the semiconductor. Because of its low forward voltage and fast switching operation, it is suitable for high-frequency use.

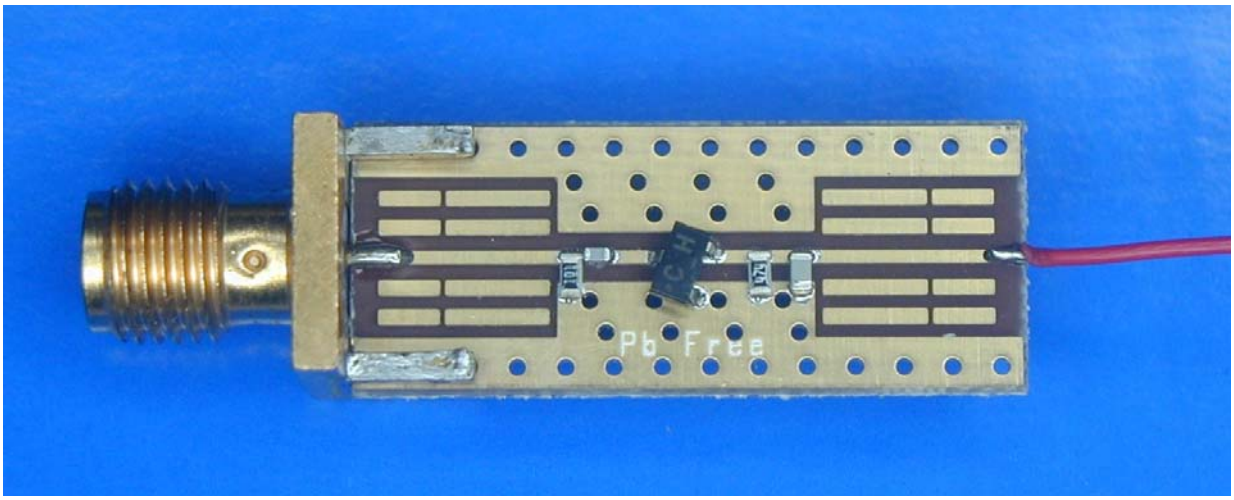
In wireless applications like radio, in order to adjust the received power level and to transmit the target power to the amplifier, it is necessary to detect the received power and to feed back the detection voltage through an AGC circuit. A Schottky diode is used in detection circuit in this case.

The principle of diode detection is rectifying the signal (AC component) through a diode and generating voltage as DC component. The detection makes use of the non-linear characteristic of the Schottky diode, so a bias circuit is not necessary.

■ Circuit Design



■ Evaluation Board



■ Bill of Materials

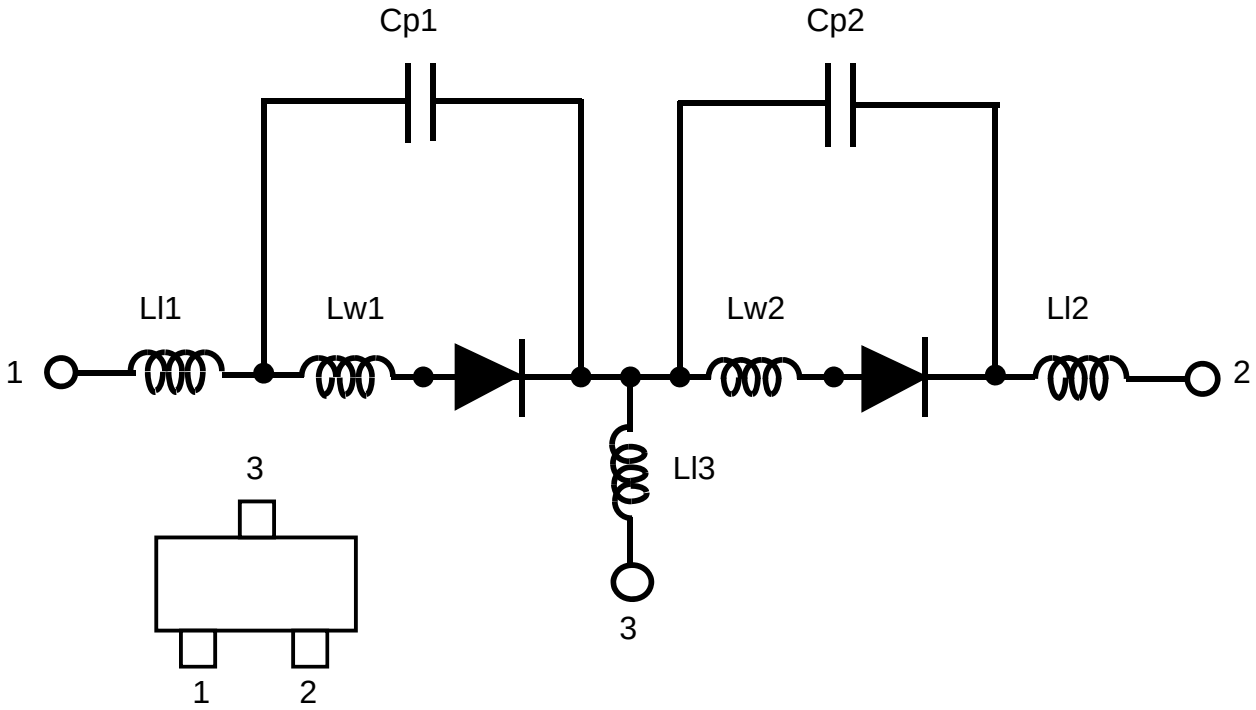
Item	Symbol	Value	Manufacture	Size
SBD	D1	NSVR351SDSA3	ON Semiconductor	SC-59
Capacitor	C1	1000 pF	Various	1005
	C2	1000 pF	Various	1608
Resistor	R1	100 Ω	Various	1608
	R2	470k Ω	Various	1608
Material		FR-4		25 x 10 mm

■ Spice Model

Model : Diode

Parameter	Value	Unit	Parameter	Value	Unit
IS	500n	A	TT	5n	S
N	1		XTI	2.0	
BV	5.0	V	EG	0.69	eV
IBV	200μ	A	Cp1	90f	F
RS	1.7	Ω	Cp2	90f	F
FC	0.5		Ll1	0.8n	H
CJO	700f	F	Ll2	0.8n	H
VJ	240m	V	Ll3	0.5n	H
M	157m		Lw1	0.8n	H
			Lw2	0.8n	H

■ Equivalent Circuit Model



■ Measurement Results

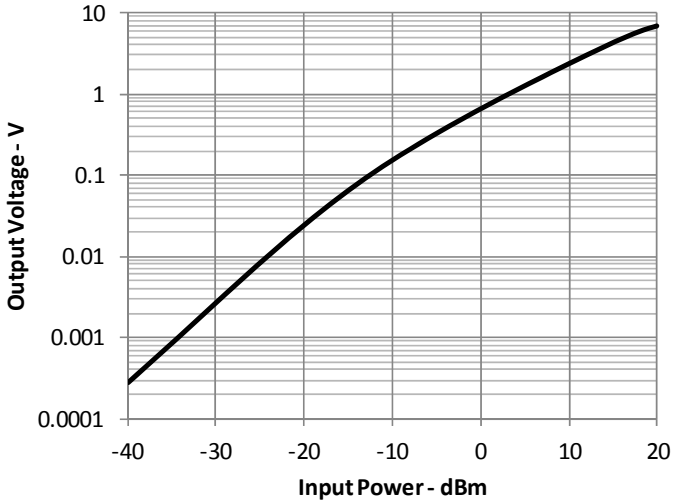


Figure 1 Output Voltage vs. Input Power