Triple +5V/+40V PIN Diode Switch Driver

GENERAL DESCRIPTION

The 99138 is a driver featuring high speed suited for driving high power SP3T switch using Vpos and GND.

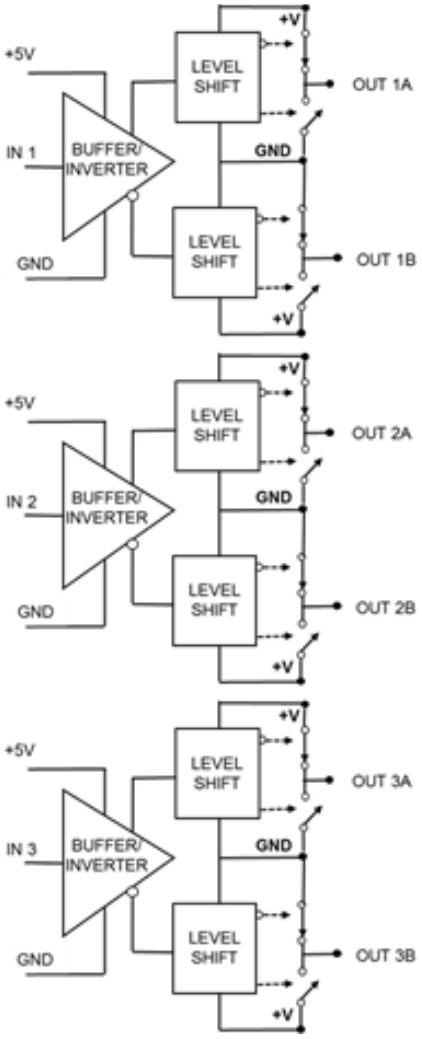
The driver is compatible with 3.3/5.0 V CMOS logic and has 3 independent channels to supply complementary outputs to bias series and shunt diodes. Driver is capable of sinking up to 75mA and supplying +40V and 50mA.

External current limiting resistors are required to set current.

FEATURES

- High speed <50 nS
- Compatible with CMOS FPGA outputs

FUNCTION BLOCK DIAGRAM



MECHANICAL

The 99138 consists of laminate substrate and sealed with a dam and fill process. This forms a 12 x 12 mm 18 lead SMT assembly designed for integration into an integrated microwave assembly.

99138 contains no solder and is RoHS compliant.

PIN CONNECTIONS

Pin 1, 4, 7 (Vpos1) not internally connected, need connection

Pin 2, 5,8 (GND) are not internally connected, need connection

Pins 12, 15, 18 (Vpos2) are not internally connected, need connection

Backside paddle connected to GND. Recommend bypassing Vpos2 and Vpos1 with .1 uF capacitor or .01 uF minimum

1 Vpos1 +5V LOGIC SUPPLY
2 Ground
3 Input 1
4 Vpos1 +5V LOGIC SUPPLY
5 Ground
6 Input 2
7 Vpos1 +5V LOGIC SUPPLY
8 Ground
9 Input 3
10 Output 3B
11 Output 3A
12 Vpos2 +40V
13 Output 2B
14 Output 2A
15 Vpos2 +40V
16 Output 1B
17 Output 1A
18 Vpos2 +40V

TRUTH TABLE

IN1	IN2	IN3	OUT1A	OUT1B	OUT2A	OUT2B	OUT3A	OUT3B
0	0	0	+V	0V	+V	0V	+V	0V
1	0	0	0V	+V	+V	0V	+V	0V
0	1	0	+V	0V	0V	+V	+V	0V
0	0	1	+V	0V	+V	0V	0V	+V
0	0	0	+V	0V	+V	0V	+V	0V

ELECTRICAL SPECIFICATIONS

Vpos1 +5V, Vpos2 +40V, TEMP 25C, PRR 250KHz

	SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
ABSOLUTE MAXIMUMS							
	Vpos1	Logic Supply Positive				7	V
	Vpos2	Positive Output Supply				45	V
	Vout	Output Current				110	mA
ENVIRONMENTAL							
	Enviro	Operating Temperature				100	Deg C
	Enviro	Storage Temperature				150	Deg C
INPUT							
	VI_hi	Voltage Input High	CMOS	2.8	3.5	5.5	V
	VI_low	Voltage Input Low	CMOS	0	.8	2.5	V
OUTPUT							
	VO_hi	Voltage Out High	open load	37.7	38.2	38.8	V
	VO_low	Voltage Out Low	open load	0	.2	.4	V
	IO_hi	Current Out High	steady state into 1V diode load		50		mA
	IO_low	Current Out Low	steady state into 1V diode load common arm resistor		-75		mA
	Iopk	Current Peak Output	sink		-150		mA
SUPPLY							
	IQC_pos	Quiescent Current Positive	0.5KHz 50% duty cycle		.1		mA
	IQC_neg	Quiescent Current Negative	0.5KHz 50% duty cycle		12		mA
DYNAMIC							
	Trise	Time Rise			15		nS
	Tfall	Time Fall			12		nS
	Td_rise	Delay Rise			30		nS
	Td_fall	Delay Fall			35		nS
	TSW_rise	Switching Speed Rise	100pF load		50		nS
	TSW_fall	Switching Speed Fall	100pF load		50		nS
	PRR	Pulse Repetition Rate	100pF load		250		KHz

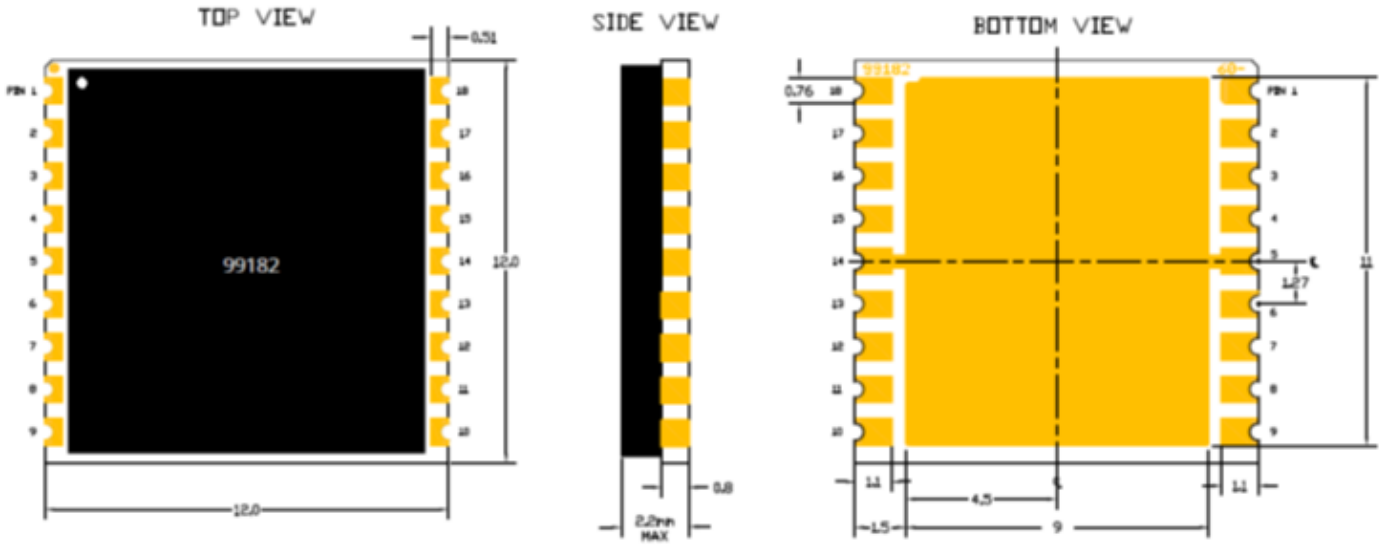
MECHANICAL SPECIFICATIONS

"DRAWING NOT TO SCALE. DIMENSIONS ARE IN INCHES, UNLESS OTHERWISE NOTED."

Length 12 mm; Width 12 mm; Height 2.2 mm MAX

MARKING SPECIFICATIONS

Part Number: 99138



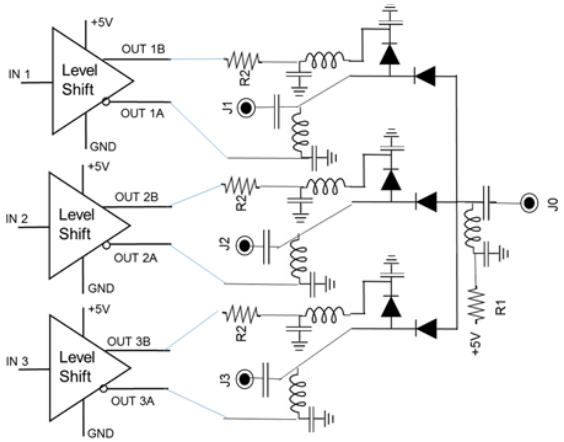
TYPICAL APPLICATION

RESISTOR CALCULATOR

R1 = Vsupply - 1.5/Iseries ex. 35 ohm = 5v - 1.5/.1A

R2 = Vpos – 2.0/Ishunt ex. 760 ohm = 38V/.05A

Common arm supply is +5V and Driver Vpos is +40V



TYPICAL APPLICATION

R1 = 35 ohm

R2 = 760 ohm

5V CMOS Logic

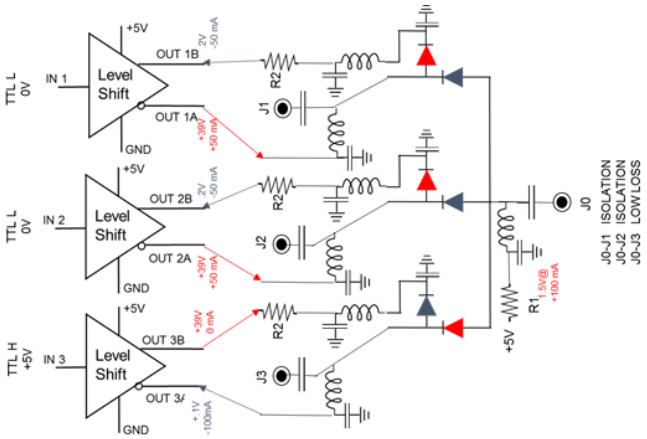
Vpos = +40V @ 100 mA (2 x 50 mA shunt diodes)

Series Diode forward bias with 100 mA

Shunt Diodes forward bias with 50 mA each

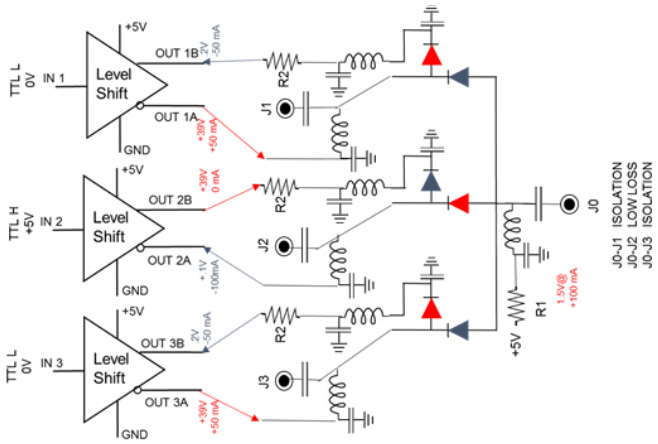
RED = forward bias diode

BLUE = back bias diode



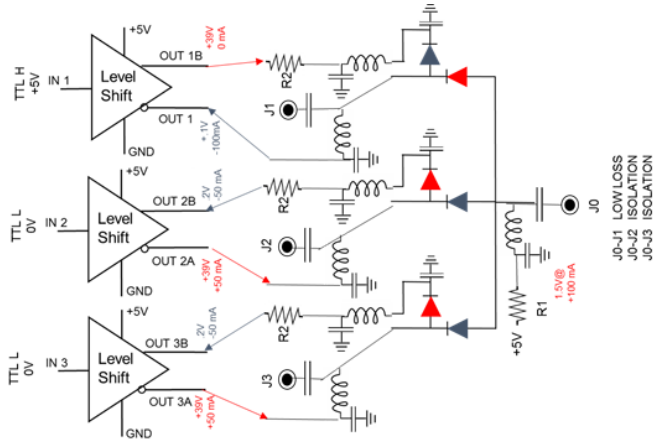
TYPICAL APPLICATION

R1 = 35 ohm
R2 = 760 ohm
5V CMOS Logic
Vpos = +40V @ 100 mA (2 x 50 mA shunt diodes)
Series Diode forward bias with 100 mA
Shunt Diodes forward bias with 50 mA each
RED = forward bias diode
BLUE = back bias diode



TYPICAL APPLICATION

R1 = 35 ohm
R2 = 760 ohm
5V CMOS Logic
Vpos = +40V @ 100 mA (2 x 50 mA shunt diodes)
Series Diode forward bias with 100 mA
Shunt Diodes forward bias with 50 mA each
RED = forward bias diode
BLUE = back bias diode



TYPICAL APPLICATION

R1 = 35 ohm
R2 = 760 ohm
5V CMOS Logic
Vpos = +40V @ 150 mA (3 x 50 mA shunt diodes)
Series Diodes back bias with 39V
Shunt Diodes forward bias with 50 mA each
RED = forward bias diode
BLUE = back bias diode