Dual +5V/+5V/-12V PIN Diode Switch Driver

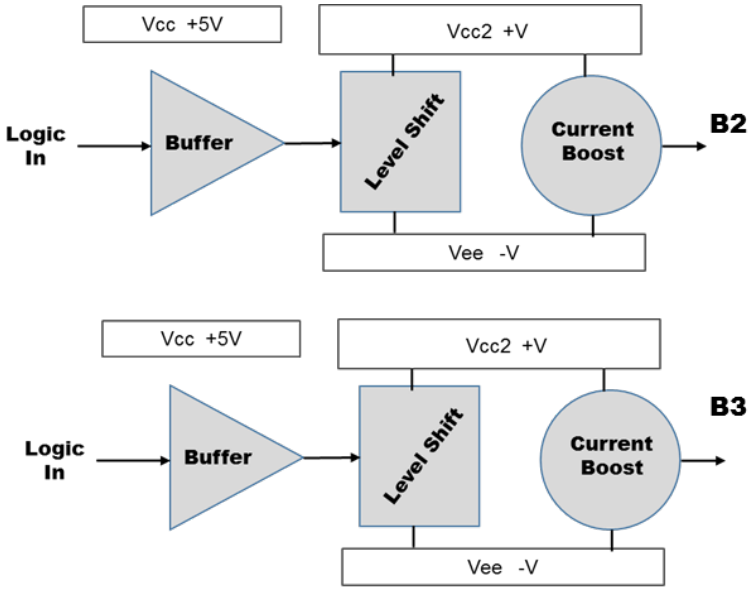
GENERAL DESCRIPTION

The 99107 is a driver featuring high speed and wide negative voltage range suited for driving MASW-002103 SP2T monolithic switch.
The driver is compatible with 3.3/5.0 V CMOS logic and has 2 independent channels to supply each bias line with up to +40 mA current to forward bias the shunt diode and –40mA and -5 to -28V to bias the series diode.
External current limiting resistors are required to set current.

FEATURES

- Ultra high speed <20nS
- Compatible with CMOS FPGA outputs

FUNCTION BLOCK DIAGRAM

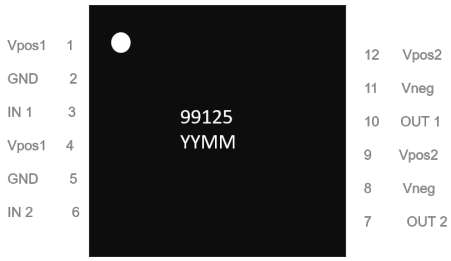


MECHANICAL

The 99107 consists of silicon BJT semiconductors soldered to a laminate substrate and sealed with a dam and fill process. This forms a 8 x 8 mm 12 lead SMT assembly designed for integration into an integrated microwave assembly.

ECCN Code EAR99

99107 is RoHS 3 (EU 2015/863) compliant.



PIN CONNECTIONS

Pins 1, 4 (+5V) not internally connected, need connection
Pins 2,5 (GND) are not internally connected, need connection
Pins 9, 12 (Vpos2) are not internally connected, need connection
Pins 8, 11 (Vneg) are not internally connected, need connection
Backside paddle left floating or GND. Recommend bypassing Vpos2 and Vneg 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 Output 2
8 Vneg -5V TO -28V
9 Vpos2 +5V
10 Output 1
11 Vneg -5V TO -28V
12 Vpos2 +5V

TRUTH TABLE

IN1	IN2	OUT1 (B2)	OUT2 (B3)
1	1	+20mA	+20mA
0	1	-40mA	+20mA
1	0	+20mA	-40mA

ELECTRICAL SPECIFICATIONS

Vpos1 +5V, Vpos2 +5V, Vneg -12V, TEMP 25C, PRR .5MHz

	SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
INPUT							
	VI_hi	Voltage Input High	CMOS	2.8	4	5.5	V
	VI_low	Voltage Input Low	CMOS	0	.8	1.2	V
OUTPUT							
	VO_hi	Voltage Out High	open load	5.2	5.5	5.8	V
	VO_low	Voltage Out Low	open load	-4.8	-11.5	-4.2	V
	IO_hi	Current Out High	steady state into 1V diode load		20		mA
	IO_low	Current Out Low	steady state into 1V diode load common arm resistor		-4		mA
	Iopk	Current Peak Output	sink		-100		mA
SUPPLY							
	IQC_pos	Quiescent Current Positive	0.5MHz 50% duty cycle		9		mA
	IQC_neg	Quiescent Current Negative	0.5MHz 50% duty cycle		7		mA
DYNAMIC							
	Trise	Time Rise			7		nS
	Tfall	Time Fall			7		nS
	Td_rise	Delay Rise			5		nS
	Td_fall	Delay Fall			5		nS
	TSW_rise	Switching Speed Rise	10pF load		15		nS
	TSW_fall	Switching Speed Fall	10pF load		15		nS
	PRR	Pulse Repetition Rate	Max, 10pF load		1	5	MHz

ESD Sensitivity HBM Class 1B

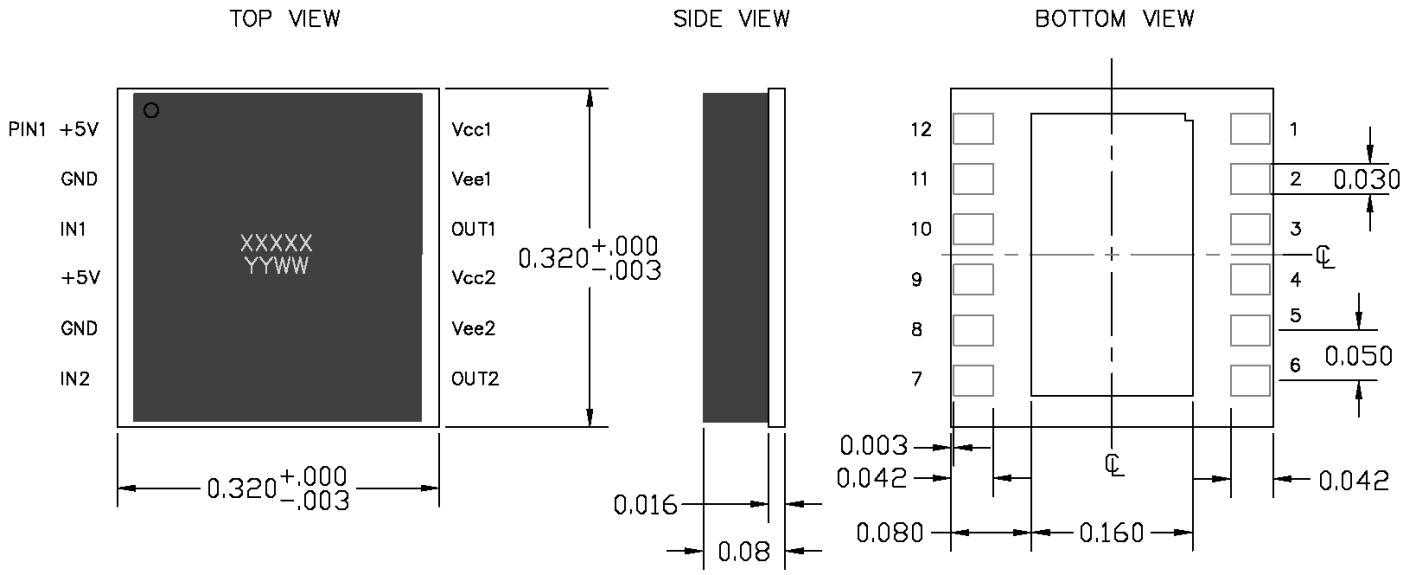
MECHANICAL SPECIFICATIONS

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

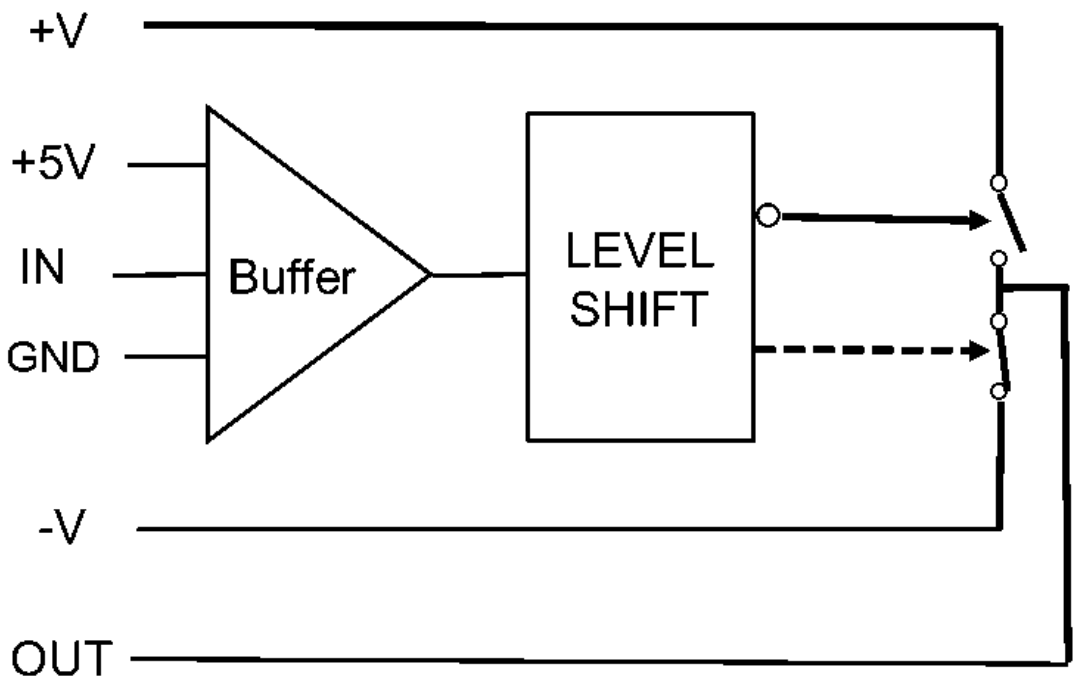
MSL RATING 4 (refer to JEDEC STD 033B)
Shipping Packaging
Waffle Packs/trays
Type: Board
Length .320 in NOM; Width .320 in NOM; Height .08 in NOM

MARKING SPECIFICATIONS

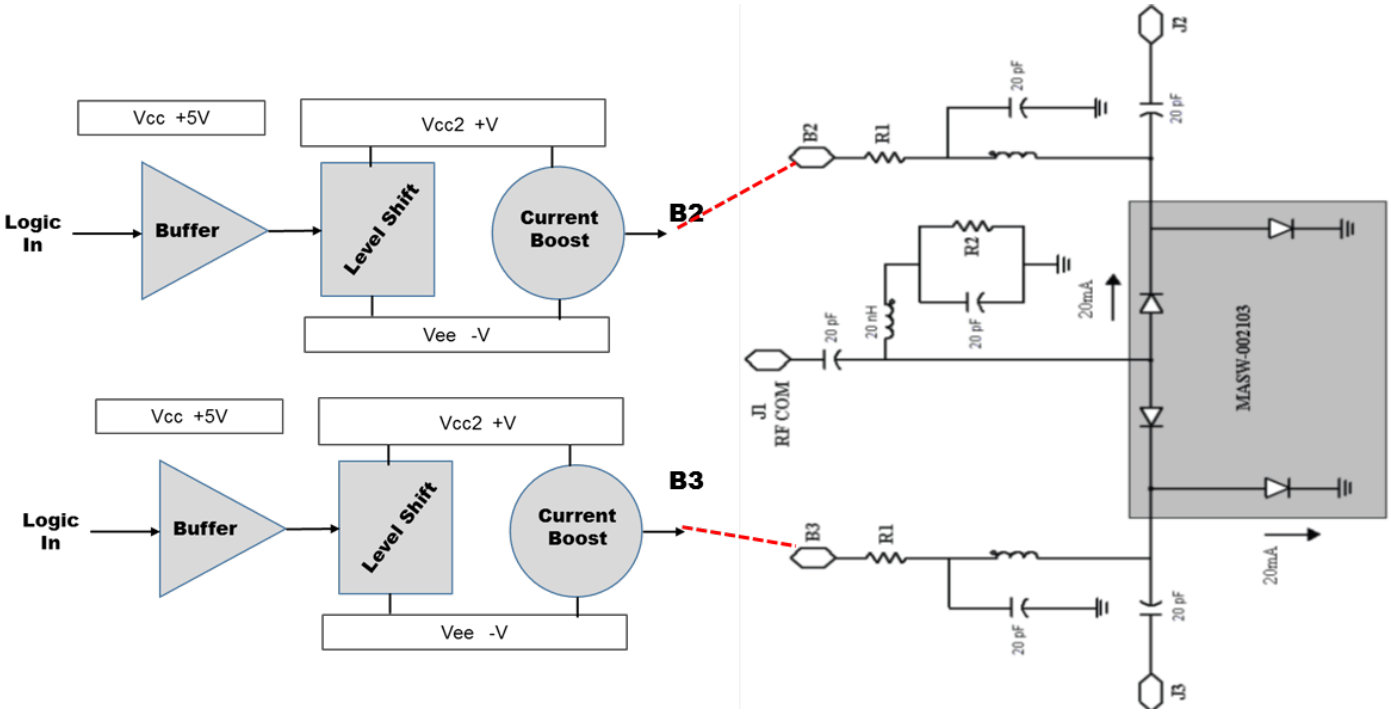
Dot Only Marking



FUNCTIONAL SINGLE CHANNEL



TYPICAL APPLICATION



CALCULATOR

Driving masw-002103 with 99107

Current Setting Calculator

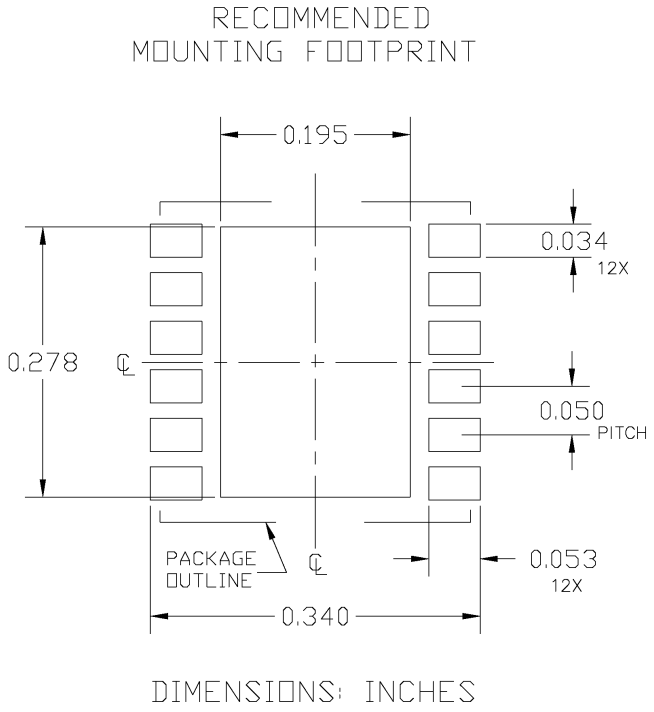
V+=6V
V-=-15v

Set R1= $(V^+ -2)/A$ A is desired current in shunt diode
example 200 ohm=(6V-2)/.02A

Set R2=$((V^- +2)/A)-R1$ A is desired current in series diode
example 125 ohm=((-15V+2)/.04A)-200 ohm

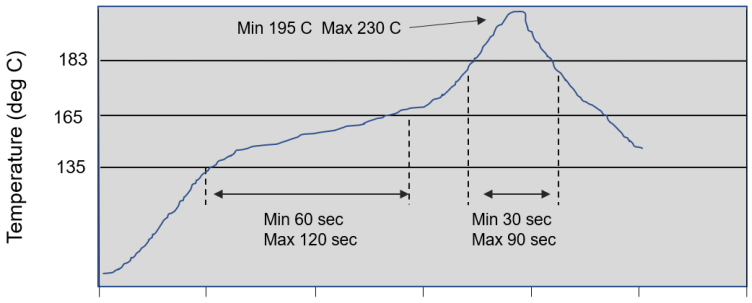
This example provides 6V of back bias to series off diode and shunt off diode

FOOTPRINT



SOLDER PROFILE

SnPb Temperature Profile example



Pb-Free Temperature Profile example