

## GENERAL DESCRIPTION

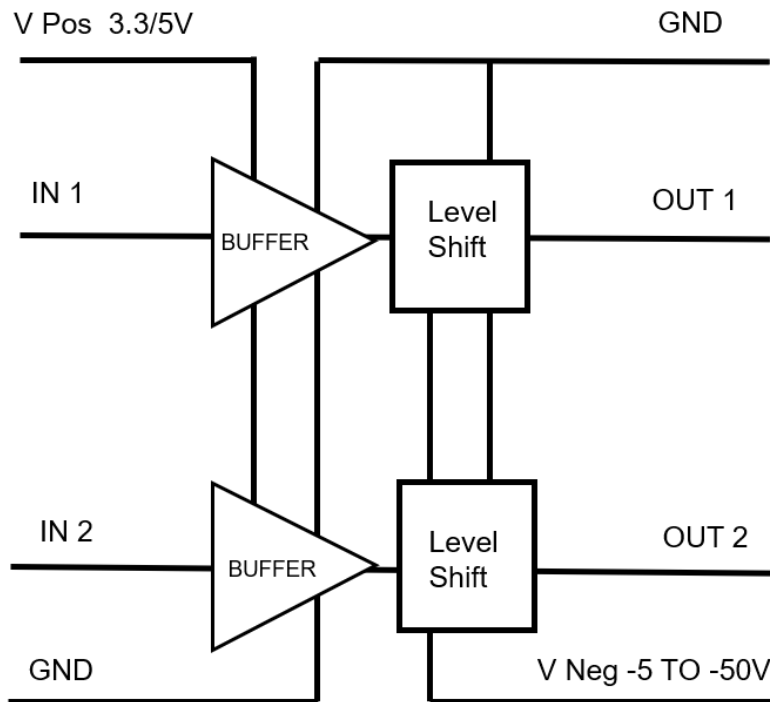
The MDI2354 is a driver with 2 toggling channels featuring high speed and wide negative voltage range suited for driving TGS2354 SP2T GaN switch MMIC.

The driver is compatible with 3.3/5.0 V CMOS logic and supplies 0V and -V from -5V to -50V to bias the GaN FETs.

## FEATURES

- Ultra high speed <20ns
- Compatible with CMOS FPGA outputs
- Well suited to drive Qorvo TGS2354 SPDT GaN Switch MMIC

## FUNCTION BLOCK DIAGRAM

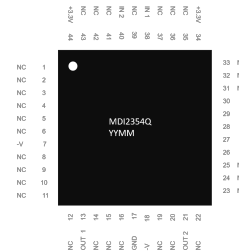


## MECHANICAL

The MDI2354Q is constructed on an alumina thick film substrate with thick film resistors and discrete wirebonded silicon bipolar transistors. The driver is housed in a 7mm square 44 lead .5 mm pitch QFN and is designed for integration into an integrated microwave assembly which operates in harsh environments of high temperature and vibration.

ECCN Code EAR99

MDI2354Q is RoHS 3 (EU 2015/863) compliant.



## PIN CONNECTIONS

INPUT PINS MUST BE CONNECTED TO LOGIC LEVELS OR TIED LOW OR HIGH THROUGH 5K RESISTOR. INPUTS MUST NEVER BE ALLOWED TO FLOAT

V pos should match logic family. ex when using 3.3V logic Vpos =3.3V

1	NC	23	NC
2	NC	24	NC
3	NC	25	NC
4	NC	26	-5 TO -50V
5	NC	27	NC
6	NC	28	NC
7	-5 TO -50V	29	NC
8	NC	30	NC
9	NC	31	NC
10	NC	32	NC
11	NC	33	NC
12	NC	34	+5V / +3.3V
13	Output 1	35	NC
14	NC	36	NC
15	NC	37	NC
16	NC	38	Input 1
17	Ground	39	NC
18	NC	40	Input 2
19	NC	41	NC
20	NC	42	NC
21	Output 2	43	NC
22	NC	44	+5V / +3.3V

**TRUTH TABLE**

INPUT1 INPUT2 OUT1 OUT2

0	1	-V	0V
1	0	0V	-V
0	0	-V	-V

**ELECTRICAL SPECIFICATIONS**

Vpos +3.3V, Vneg -50V, TEMP 25C, PRR .1MHz

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
<b>ABSOLUTE MAXIMUMS</b>						
Vpos	Logic Supply Positive		0		+7	V
Vneg	Supply Voltage Negative		-55		0	V
To	Operating Temperature		-54		+125	Deg C
Ts	Storage Temperature		-65		+150	Deg C
<b>INPUT</b>						
VI_hi	Voltage Input High	3.3V LOGIC	1.8	3.0	5	V
VI_low	Voltage Input Low	3.3V LOGIC	0	.8	1.0	V
<b>OUTPUT</b>						
VO_hi	Voltage Out High	open load	-2	0	0	V
VO_low	Voltage Out Low	open load	-49.2	-50	-50	V
IO_hi	Current Out High	steady state into GaN FET control input			20	mA
IO_low	Current Out Low	steady state			-20	mA
<b>SUPPLY</b>						
IQC_pos	Quiescent Current Positive	0.1MHz 50% duty cycle		2		mA
IQC_neg	Quiescent Current Negative	0.1MHz 50% duty cycle		3		mA
<b>DYNAMIC</b>						
Trise	Time Rise			5		nS
Tfall	Time Fall			5		nS
Td_rise	Delay Rise			10		nS
Td_fall	Delay Fall			10		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		.2		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

Package Code Q

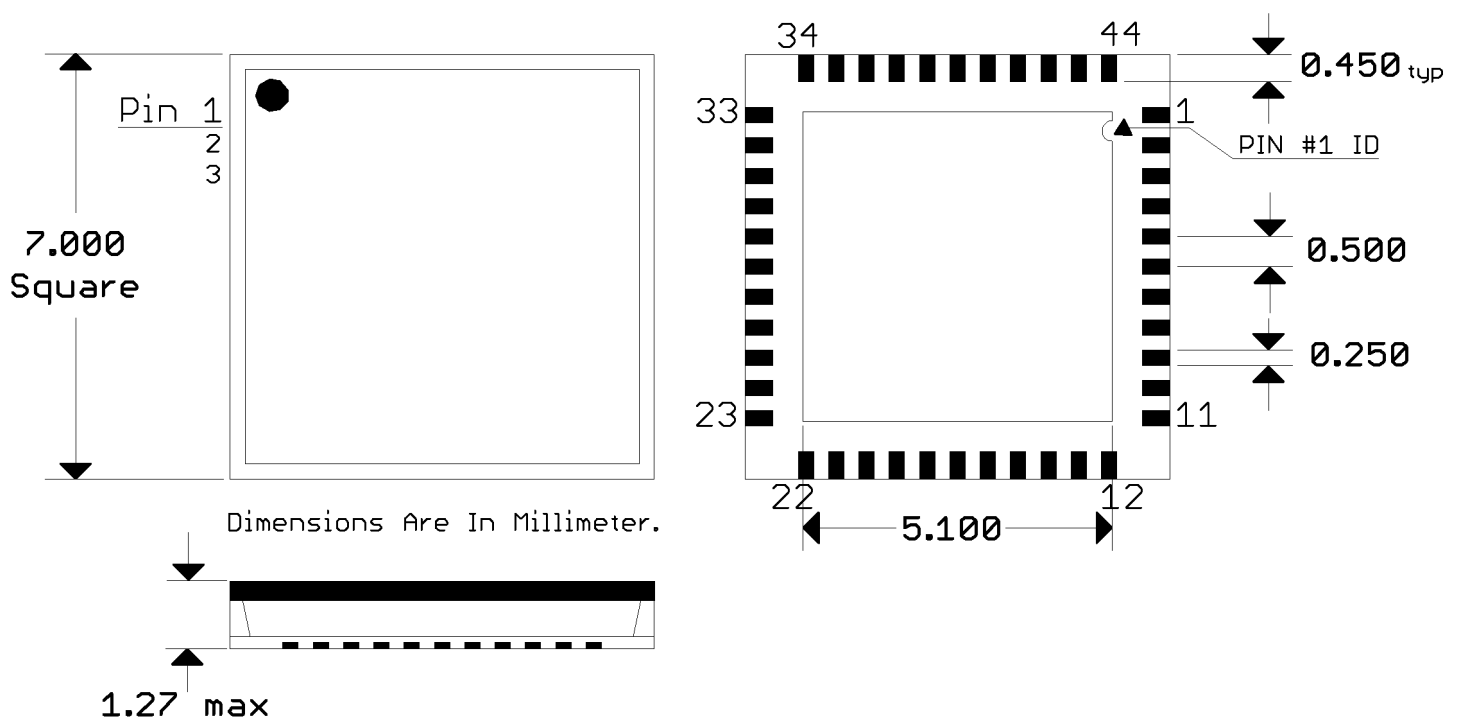
Type: Housing; Lead Finish: Gold

Length 7.000 mm MAX; Width 7.000 mm MAX; Height 1.27 mm MAX; Weight .1 grams MAX

**MARKING SPECIFICATIONS**

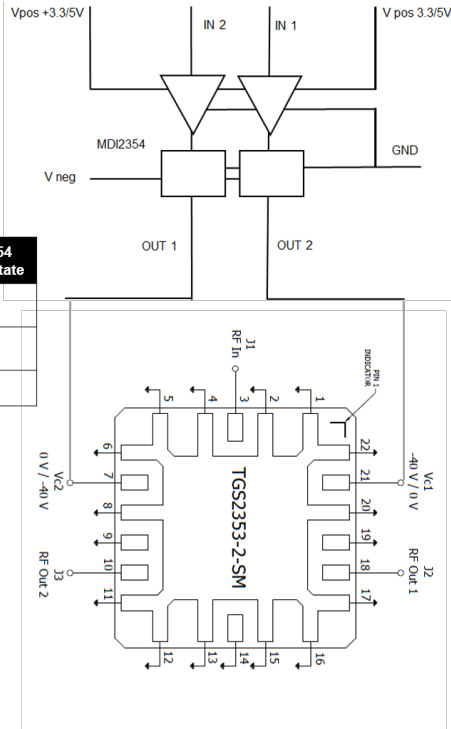
Logo: Impellimax

Part Number: MDI2354Q



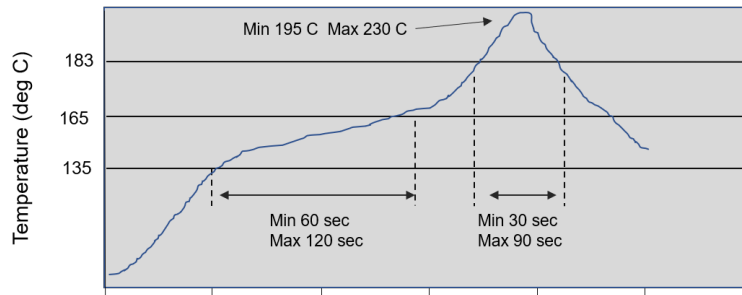
**TYPICAL APPLICATION**

Logic in	Logic in	MDI2354 output	MDI2354 output	TGS2354 Switch State	TGS2354 Switch State
IN 1	IN 2	OUT 1	OUT 2	J0-J1	J0-J2
0	1	-V	0V	LOSS	ISO
1	0	0V	-V	ISO	LOSS



**SOLDER PROFILE**

SnPb Temperature Profile example



Pb-Free Temperature Profile example

