

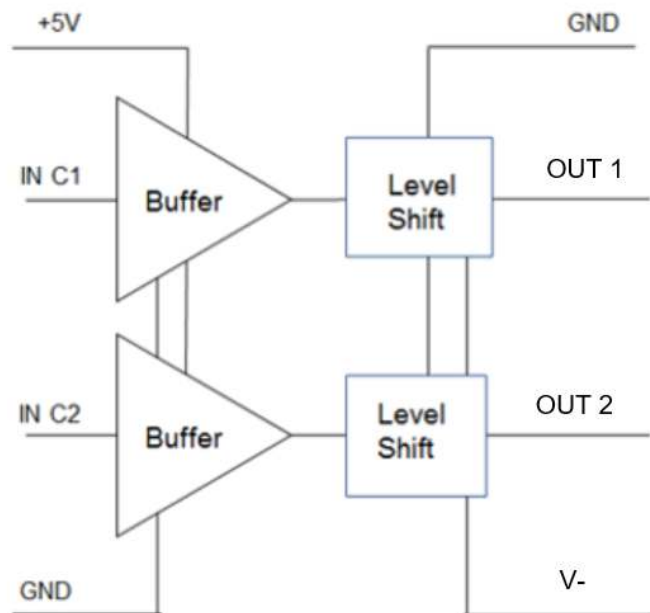
## GENERAL DESCRIPTION

The MDD000N300Q16A is a driver featuring high speed and wide negative voltage range suited for driving SP2T GaN monolithic switch. The driver is compatible with 3.3/5.0 V CMOS logic and has 2 independent channels to supply each bias line 0V and -5 to -30V to bias the GaN FET on and off.

## FEATURES

- Ultra high speed <20nS
- Independent control for all OFF switch condition
- Drives capacitive loads fast
- Compatible with CMOS FPGA outputs
- Compatible with TGS2353-2

## FUNCTION BLOCK DIAGRAM

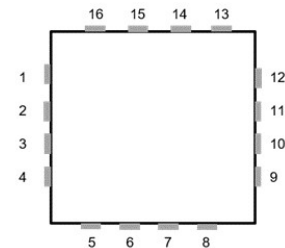


## MECHANICAL

The MDD000N300Q16A consists of monolithic silicon BJT IC wire-bonded to a laminate substrate and sealed with a dam and fill process. This forms a 4 x 4 mm 16 lead QFN SMT assembly designed for integration into an integrated microwave assembly.

ECCN Code EAR99

MDD000N300Q16A is RoHS compliant.



## PIN CONNECTIONS

Pins 2, 8, 11 (V-) are not internally connected, need connection

- |    |                  |
|----|------------------|
| 1  | OUT A            |
| 2  | V- (-5V to -30V) |
| 3  | C1               |
| 4  | Ground           |
| 5  | C2               |
| 6  | NC               |
| 7  | NC               |
| 8  | V- (-5V to -30V) |
| 9  | NC               |
| 10 | Output B         |
| 11 | V- (-5V to -30V) |
| 12 | +5V              |
| 13 | NC               |
| 14 | NC               |
| 15 | NC               |
| 16 | NC               |

## TRUTH TABLE

IN C1   IN C2   OUT 1   OUT 2

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

## ELECTRICAL SPECIFICATIONS

Vpos +5V, GND GND, Vneg -30V, TEMP 25C, PRR 0.5MHz

|                | SYMBOL   | PARAMETER                  | CONDITIONS  | MIN   | TYP   | MAX | UNITS |
|----------------|----------|----------------------------|---|-------|-------|-----|-------|
| <b>INPUT</b>   |          |                            |   |       |       |     |       |
|                | VI_hi    | Voltage Input High         | CMOS  | 2.8   | 4     | 5.5 | V     |
|                | VI_low   | Voltage Input Low          | CMOS  | 0     | .8    | 1.2 | V     |
| <b>OUTPUT</b>  |          |                            |   |       |       |     |       |
|                | VO_hi    | Voltage Out High           | open load   | -0.1  | 0     | 0.2 | V     |
|                | VO_low   | Voltage Out Low            | open load   | -29.4 | -29.5 | -30 | V     |
|                | IO_hi    | Current Out High           | steady state into 1V diode load                     |       | 5     |     | mA    |
|                | IO_low   | Current Out Low            | steady state into 1V diode load common arm resistor |       | -5    |     | mA    |
|                | lopk     | Current Peak Output        | sink  |       | -100  |     | mA    |
| <b>SUPPLY</b>  |          |                            |   |       |       |     |       |
|                | IQC_pos  | Quiescent Current Positive | 0.5MHz 50% duty cycle                               |       | 1     |     | mA    |
|                | IQC_neg  | Quiescent Current Negative | 0.5MHz 50% duty cycle                               |       | -1    |     | mA    |
| <b>DYNAMIC</b> |          |                            |   |       |       |     |       |
|                | Trise    | Time Rise                  |   |       | 3     |     | nS    |
|                | Tfall    | Time Fall                  |   |       | 3     |     | 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                                      |       | 0.5   |     | MHz   |

ESD Sensitivity HBM Class1B

**MECHANICAL SPECIFICATIONS**

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

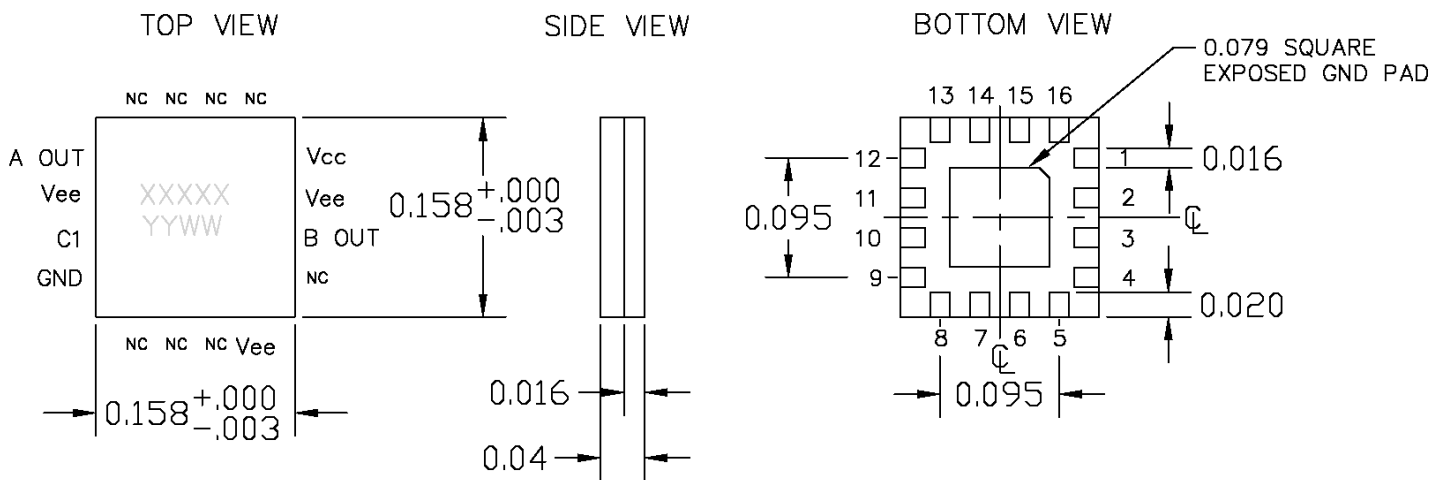
MSL RATING 4 (refer to JEDEC STD 033B)

Shipping Packaging  
Waffle Packs/trays

Type: Board  
Length .158 in NOM; Width .158 in NOM; Height .040 in MAX

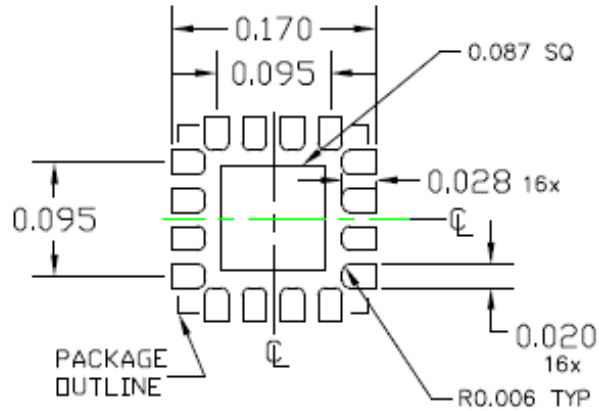
**MARKING SPECIFICATIONS**

Part Number: E7A13  
Date Code: YYWW



**FOOTPRINT**

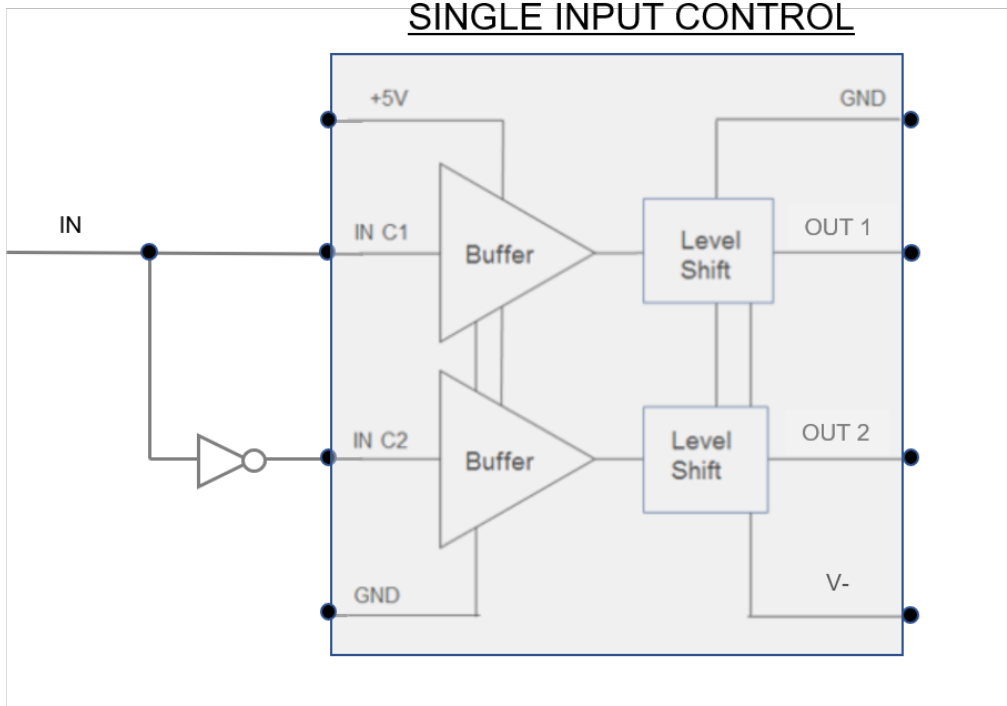
RECOMMENDED  
MOUNTING FOOTPRINT



DIMENSIONS: INCHES

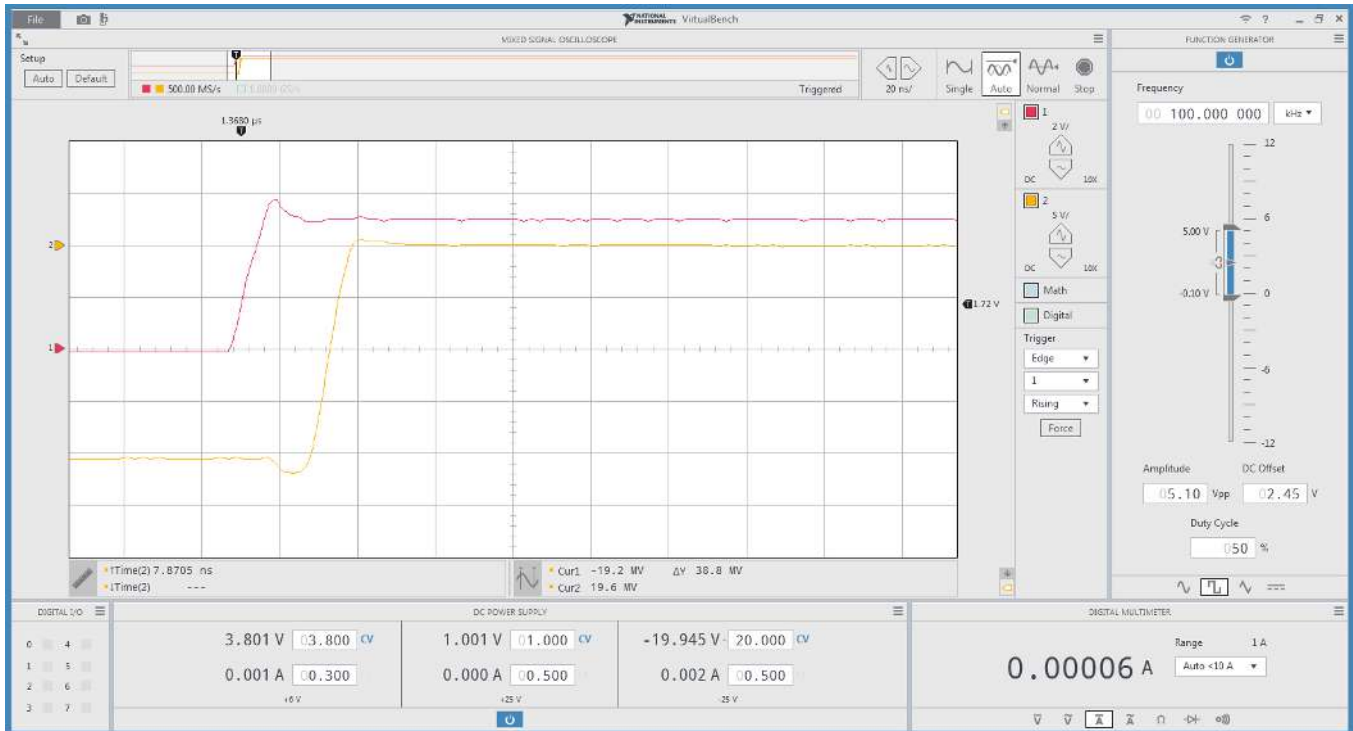
**TYPICAL APPLICATION**

SINGLE INPUT CONTROL



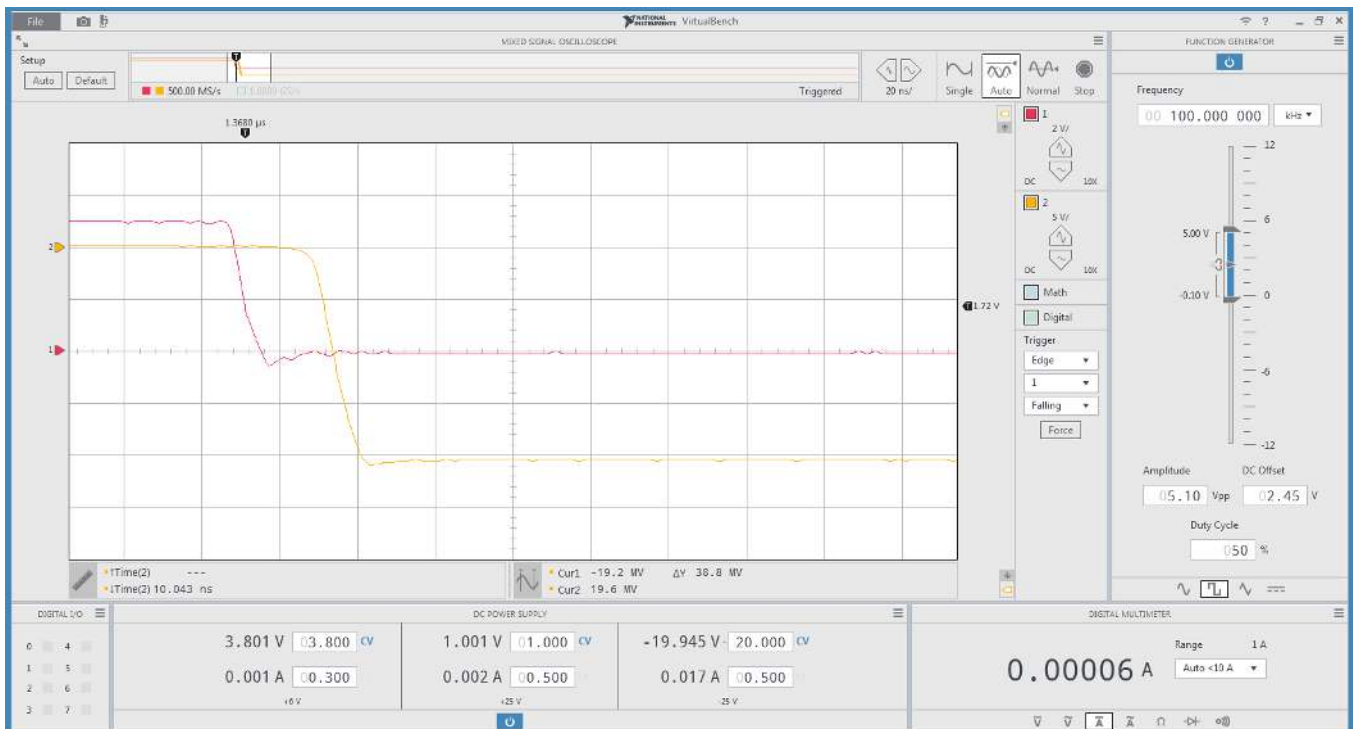
## WAVEFORM

20V Rise Time graph. X=5V/div, Y=20nS/div



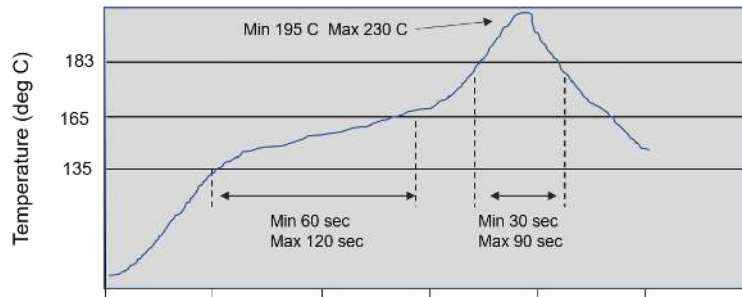
## WAVEFORM

20V Fall Time graph. X=5V/div, Y=20nS/div



**SOLDER PROFILE**

SnPb Temperature Profile example



Pb-Free Temperature Profile example

