



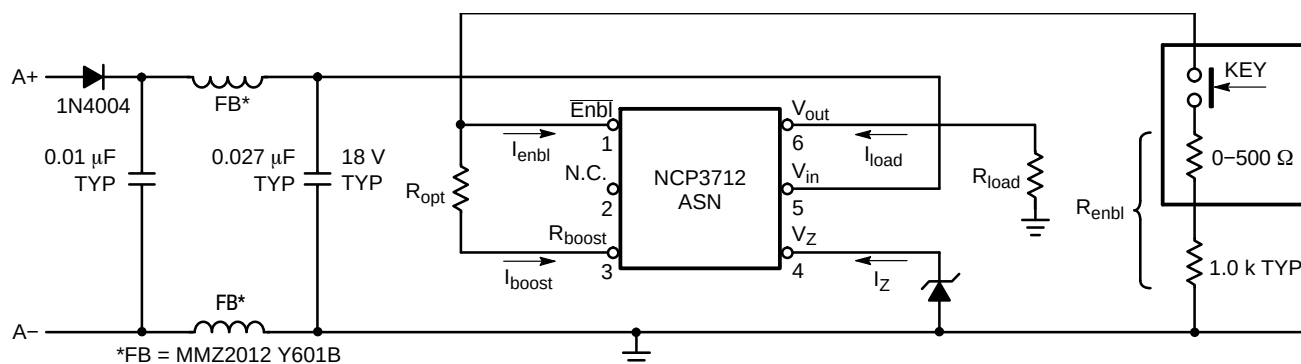
## NCP3712ASN, SZNCP3712ASN

**MAXIMUM RATINGS** (T<sub>J</sub> = 25°C unless otherwise noted) (Note 1)

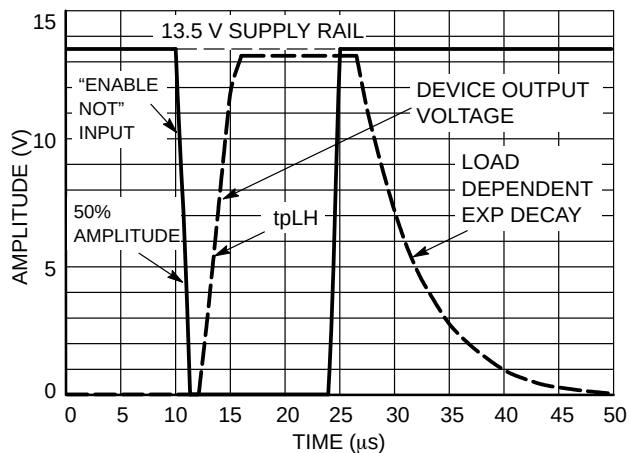
| Rating                                       | Symbol        | Value       | Unit  |
|----------------------------------------------|---------------|-------------|-------|
| Input-to-Output Voltage                      | $V_{IO}$      | 105         | V     |
| Reverse Input-to-V <sub>Z</sub> Voltage      | $V_{in(Rev)}$ | -9.0        | V     |
| Reverse Input-to-Rboost Voltage              | $V_{in(Rev)}$ | -5.0        | V     |
| Output Load Current – Continuous             | $I_{load}$    | -300        | mA    |
| Enbl Input Current – Continuous              | $I_{enbl}$    | 5.0         | mA    |
| V <sub>Z</sub> Input Current – Continuous    | $I_Z$         | 3.0         | mA    |
| Rboost Input Current – Continuous            | $I_{boost}$   | 10          | mA    |
| Junction Temperature                         | $T_J$         | 125         | °C    |
| Operating Ambient Temperature Range          | $T_A$         | -40 to +85  | °C    |
| Storage Temperature Range                    | $T_{stg}$     | -65 to +150 | °C    |
| Device Power Dissipation (Minimum Footprint) | $P_D$         | 300         | mW    |
| Derate Above 25°C                            | –             | 2.4         | mW/°C |
| Latchup Performance:                         |               |             |       |
| Positive                                     | $I_{Latchup}$ | 200         | mA    |
| Negative                                     |               | 200         |       |

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

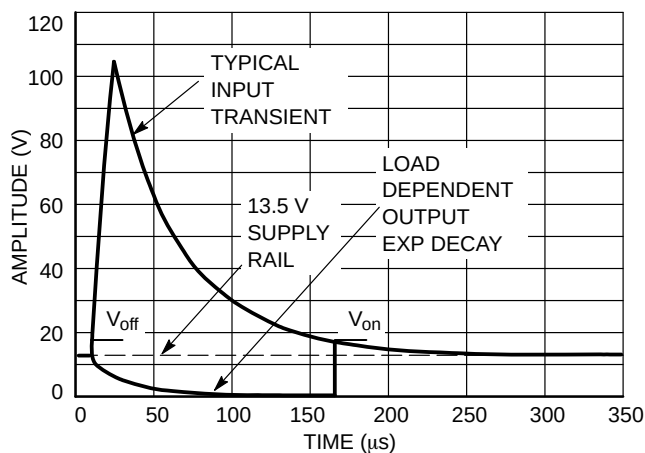
1. This device contains ESD protection and exceeds the following tests:  
Human Body Model 1500 V per MIL-STD-883, Method 3015.  
Machine Model Method 150 V.



### Figure 2. Typical Applications Circuit for Load Dump Transient Protection



### Figure 3. Enable NOT Switching Waveforms



### Figure 4. Load Dump Waveforms

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## ELECTRICAL CHARACTERISTICS ( $V_{in} = 12.5 V_{DC}$ Ref to Gnd, $T_A = 25^\circ C$ unless otherwise noted.)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|----------------|--------|-----|-----|-----|------|
|----------------|--------|-----|-----|-----|------|

### OFF CHARACTERISTICS

|                                                                                    |                 |      |      |      |              |
|------------------------------------------------------------------------------------|-----------------|------|------|------|--------------|
| Input-Output Breakdown Voltage<br>(@ $I_{out} = 200 \mu A$ )                       | $V_{(BRio)}$    | 105  | –    | –    | Vdc          |
| Output Reverse Breakdown Voltage<br>(@ $I_{out} = -1.0 mA$ Pulse)                  | $V_{(-BRout)}$  | –    | -0.7 | –    | Vdc          |
| Output Leakage Current<br>( $V_{in} = V_{enbl} = 30 V$ , $T_A = 25^\circ C$ )      | $I_{load(off)}$ | –    | –    | -100 | $\mu A_{dc}$ |
| Guaranteed "Off" State "ENBL NOT" Voltage<br>( $I_O \leq 100 \mu A$ )              | $V_{enbl(off)}$ | 13   | –    | –    | Vdc          |
| Required "Off" State $I_Z$ Current<br>( $R_{load} = 100 \Omega$ )                  | $I_{Z(off)}$    | 150  | –    | –    | $\mu A_{dc}$ |
| $V_{in(off)}$<br>( $V_Z = 16 V$ , $I_{load} = 100 mA$ , $R_{enbl} = 1500 \Omega$ ) | $V_{off}$       | 15.5 | –    | 18.7 | Vdc          |

### ON CHARACTERISTICS

|                                                                                                                                                                                                            |              |             |             |                      |           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------|-------------|----------------------|-----------|
| Input-Output On Voltage<br>( $I_O = 100 mA$ , $I_{enbl} = -3.0 mA$ )                                                                                                                                       | $V_{io(on)}$ | –           | 0.2         | 0.5                  | Vdc       |
| Output Load Current — Continuous<br>( $I_{enbl} = -3.0 mA$ , $V_{io(on)} = 0.5 V_{dc}$ )<br>( $I_{boost} = -9.0 mA$ , $V_{io(on)} = 0.5 V_{dc}$ )<br>( $I_{boost} = -9.0 mA$ , $V_{io(on)} = 0.6 V_{dc}$ ) | $I_{O(on)}$  | –<br>–<br>– | –<br>–<br>– | -200<br>-200<br>-300 | $mA_{dc}$ |
| $V_{in(on)}$<br>( $V_Z = 16 V$ , $I_{load} = 100 mA$ , $R_{enbl} = 1500 \Omega$ )                                                                                                                          | $V_{on}$     | 8.5         | –           | 10.5                 | Vdc       |
| "ENBL NOT" Input Current<br>( $I_O = 100 mA$ , $V_{io(on)} = 0.35 V_{dc}$ , $R_{enbl} = 1500 \Omega$ )                                                                                                     | $I_{enbl}$   | –           | –           | -1.0                 | $mA_{dc}$ |

### SWITCHING CHARACTERISTICS

|                                                                                                                                                                 |                        |        |            |        |         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------|------------|--------|---------|
| Propagation Delay Time:<br>Hi to Lo Prop Delay; Fig. 3 ( $V_{in} = V_{enbl} = 13.5 V$ )<br>Lo to Hi Prop Delay; Fig. 3 ( $V_{in} = 13.5 V$ , $V_{enbl} = 0 V$ ) | $t_{PHL}$<br>$t_{PLH}$ | –<br>– | 1.5<br>1.5 | –<br>– | $\mu S$ |
| Transition Times:<br>Fall Time; Fig. 4 ( $V_{in} = V_{enbl} = 13.5 V$ )<br>Rise Time; Fig. 4 ( $V_{in} = V_{enbl} = 0 V$ )                                      | $t_f$<br>$t_r$         | –<br>– | 75<br>400  | –<br>– | $nS$    |

### INTERNAL RESISTORS

|                         |    |     |     |     |           |
|-------------------------|----|-----|-----|-----|-----------|
| Input Leakage Resistor  | R2 | 7.0 | 10  | 13  | $k\Omega$ |
| Input Resistor          | R1 | 3.3 | 4.7 | 6.1 | $k\Omega$ |
| Output Leakage Resistor | R4 | 1.4 | 2.4 | 3.2 | $k\Omega$ |
| Enable Input Resistor   | R3 | 1.4 | 2.4 | 3.2 | $k\Omega$ |

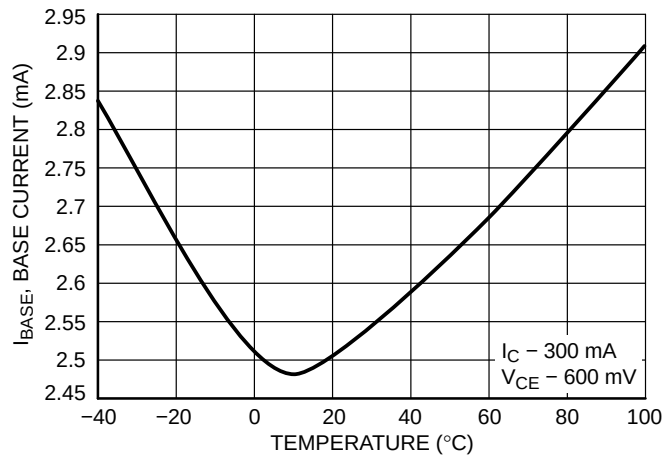


Figure 5. Q2 Base Current vs Temperature with Pin 4 Open

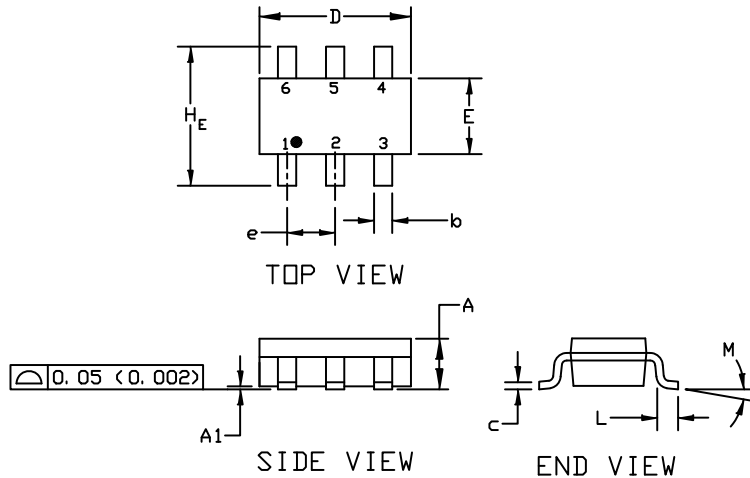
# MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS



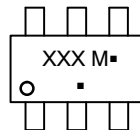
SCALE 2:1

## SC-74 CASE 318F ISSUE P

DATE 07 OCT 2021



### GENERIC MARKING DIAGRAM\*



XXX = Specific Device Code  
M = Date Code  
▪ = Pb-Free Package

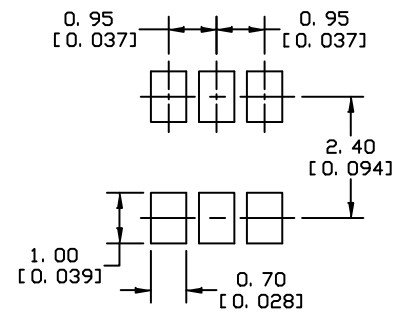
(Note: Microdot may be in either location)

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.

### NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994
2. CONTROLLING DIMENSION: INCHES
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF THE BASE MATERIAL.

| DIM            | MILLIMETERS |      |      | INCHES |       |       |
|----------------|-------------|------|------|--------|-------|-------|
|                | MIN.        | NOM. | MAX. | MIN.   | NOM.  | MAX.  |
| A              | 0.90        | 1.00 | 1.10 | 0.035  | 0.039 | 0.043 |
| A1             | 0.01        | 0.06 | 0.10 | 0.001  | 0.002 | 0.004 |
| b              | 0.25        | 0.37 | 0.50 | 0.010  | 0.015 | 0.020 |
| c              | 0.10        | 0.18 | 0.26 | 0.004  | 0.007 | 0.010 |
| D              | 2.90        | 3.00 | 3.10 | 0.114  | 0.118 | 0.122 |
| E              | 1.30        | 1.50 | 1.70 | 0.051  | 0.059 | 0.067 |
| e              | 0.85        | 0.95 | 1.05 | 0.034  | 0.037 | 0.041 |
| H <sub>E</sub> | 2.50        | 2.75 | 3.00 | 0.099  | 0.108 | 0.118 |
| L              | 0.20        | 0.40 | 0.60 | 0.008  | 0.016 | 0.024 |
| M              | 0*          | ---  | 10*  | 0*     | ---   | 10*   |



\* For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERM/D.

### SOLDERING FOOTPRINT

|                                                                                                         |                                                                                                                      |                                                                                                                   |                                                                                                                                                |                                                                                                               |                                                                                                       |
|---------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| <b>STYLE 1:</b><br>PIN 1. CATHODE<br>2. ANODE<br>3. CATHODE<br>4. CATHODE<br>5. ANODE<br>6. CATHODE     | <b>STYLE 2:</b><br>PIN 1. NO CONNECTION<br>2. COLLECTOR<br>3. EMITTER<br>4. NO CONNECTION<br>5. COLLECTOR<br>6. BASE | <b>STYLE 3:</b><br>PIN 1. EMITTER 1<br>2. BASE 1<br>3. COLLECTOR 2<br>4. EMITTER 2<br>5. BASE 2<br>6. COLLECTOR 1 | <b>STYLE 4:</b><br>PIN 1. COLLECTOR 2<br>2. EMITTER 1/EMITTER 2<br>3. COLLECTOR 1<br>4. EMITTER 3<br>5. BASE 1/BASE 2/COLLECTOR 3<br>6. BASE 3 | <b>STYLE 5:</b><br>PIN 1. CHANNEL 1<br>2. ANODE<br>3. CHANNEL 2<br>4. CHANNEL 3<br>5. CATHODE<br>6. CHANNEL 4 | <b>STYLE 6:</b><br>PIN 1. CATHODE<br>2. ANODE<br>3. CATHODE<br>4. CATHODE<br>5. CATHODE<br>6. CATHODE |
| <b>STYLE 7:</b><br>PIN 1. SOURCE 1<br>2. GATE 1<br>3. DRAIN 2<br>4. SOURCE 2<br>5. GATE 2<br>6. DRAIN 1 | <b>STYLE 8:</b><br>PIN 1. EMITTER 1<br>2. BASE 2<br>3. COLLECTOR 2<br>4. EMITTER 2<br>5. BASE 1<br>6. COLLECTOR 1    | <b>STYLE 9:</b><br>PIN 1. EMITTER 2<br>2. BASE 2<br>3. COLLECTOR 1<br>4. EMITTER 1<br>5. BASE 1<br>6. COLLECTOR 2 | <b>STYLE 10:</b><br>PIN 1. ANODE/CATHODE<br>2. BASE<br>3. EMITTER<br>4. COLLECTOR<br>5. ANODE<br>6. CATHODE                                    | <b>STYLE 11:</b><br>PIN 1. EMITTER<br>2. BASE<br>3. ANODE/CATHODE<br>4. ANODE<br>5. CATHODE<br>6. COLLECTOR   |                                                                                                       |

|                         |                    |                                                                                                                                                                                     |
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