

NCP3712ASN, SZNCP3712ASN

Over Voltage Protected High Side Switch

This switch is primarily intended to protect loads from transients by isolating the load from the transient energy rather than absorbing it.

Features

- Capable of Switching Loads of up to 200 mA without External Rboost
- Switch Shuts Off in Response to an Over Voltage Input Transient
- Features Active Turn Off for Fast Input Transient Protection
- Flexible Over Voltage Protection Threshold Set with External Zener
- Automatic Recovery after Transient Decays Below Threshold
- Withstands Input Transients up to 105 V Peak
- Guaranteed Off State with $\overline{\text{Enbl}}$ Input
- ESD Resistant in Accordance with the 2000 V Human Body Model
- Extremely Low Saturation Voltage
- SZ Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These are Pb-Free Devices

Applications Include:

- High Voltage Transient Isolation
- Power Switching to Electronic Modules
- DC Power Distribution in Line Operated Equipment
- Buffering Sensitive Circuits from Poorly Regulated Power Supplies
- Pre-conditioning of Voltage Regulator Input Voltage

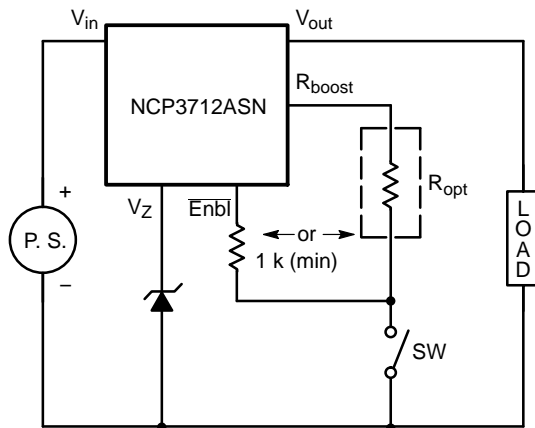


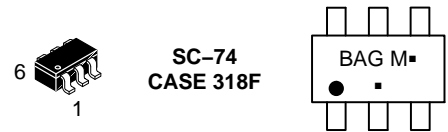
Figure 1. Typical Application Circuit



ON Semiconductor®

<http://onsemi.com>

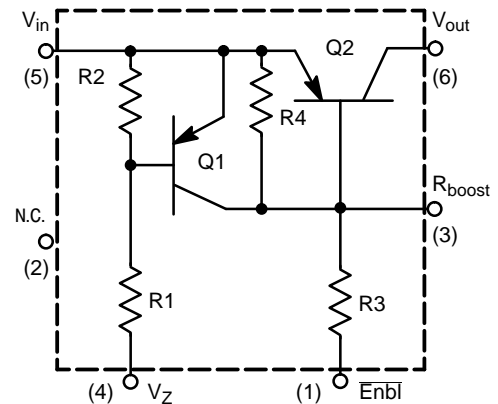
MARKING DIAGRAM



BAG = Device Code
M = Date Code
▪ = Pb-Free Package

(Note: Microdot may be in either location)

INTERNAL CIRCUIT DIAGRAM/ PIN CONFIGURATION



ORDERING INFORMATION

Device	Package	Shipping†
NCP3712ASNT1G SZNCP3712ASNT1G	SC-74 (Pb-Free)	3000 / Tape & Reel
NCP3712ASNT3G SZNCP3712ASNT3G	SC-74 (Pb-Free)	10,000 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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

ON CHARACTERISTICS

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

SWITCHING CHARACTERISTICS

Propagation Delay Time: Hi to Lo Prop Delay; Fig. 3 ($V_{in} = V_{enbl} = 13.5 V$) Lo to Hi Prop Delay; Fig. 3 ($V_{in} = 13.5 V$, $V_{enbl} = 0 V$)	t_{PHL} t_{PLH}	-	1.5	-	μS
Transition Times: Fall Time; Fig. 4 ($V_{in} = V_{enbl} = 13.5 V$) Rise Time; Fig. 4 ($V_{in} = V_{enbl} = 0 V$)	t_f t_r	-	75	-	$n S$

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	$k\Omega$

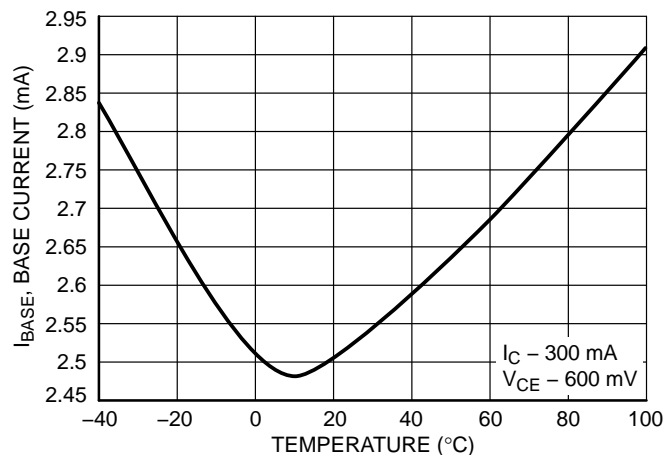


Figure 5. Q2 Base Current vs Temperature with Pin 4 Open

MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS



SCALE 2:1

SC-74
CASE 318F
ISSUE P

DATE 07 OCT 2021

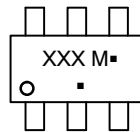


NOTES:

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
HE	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*

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.



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

SOLDERING FOOTPRINT

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

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DESCRIPTION:	SC-74	PAGE 1 OF 1

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