NCV4949C

Voltage Regulator - Low Dropout, Reset, Sense

100 mA, 5.0 V

The NCV4949C is a monolithic integrated 5.0 V voltage regulator with a very low dropout and additional functions such as reset and an uncommitted voltage sense comparator.

It is designed for supplying microcontroller/microprocessor controlled systems particularly in automotive applications. The NCV4949C has improved reset behavior for lower input and output voltage levels.

Features

- Operating DC Supply Voltage Range 5.5 V to 40 V
- High Precision Output Voltage 5.0 V ±1%
- Output Current Capability Up to 100 mA
- Very Low Dropout Voltage Less Than 0.4 V
- Reset Circuit Sensing The Output Voltage
- Programmable Reset Pulse Delay
- Voltage Sense Comparator
- Fault Protection, +60 V Peak Transient Voltage, −40 V Reverse Voltage, Short Circuit, Thermal Overload
- NCV Prefix for Automotive and Other Applications Requiring Site and Change Control
- These are Pb−Free Devices

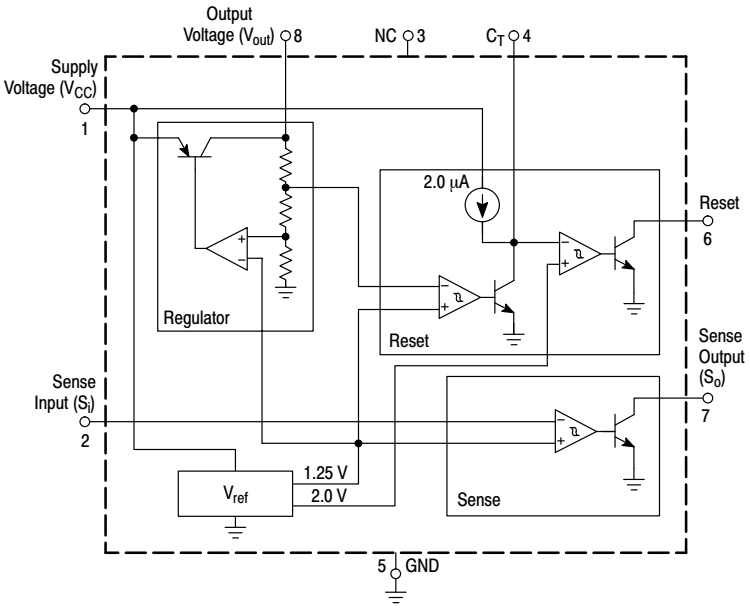

Figure 1. Representative Block Diagram

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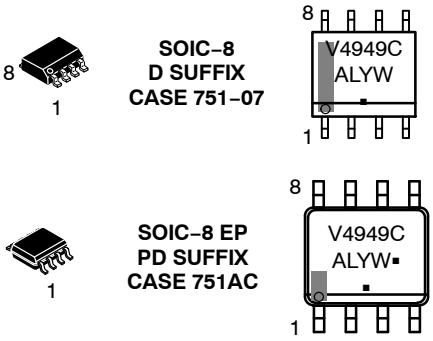
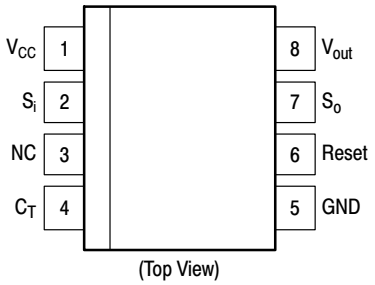
MARKING DIAGRAMS



A = Assembly Location
L = Wafer Lot
Y = Year
W = Work Week
▪ = Pb−Free Device

(Note: Microdot may be in either location)

PIN CONNECTIONS



(Top View)

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 8 of this data sheet.

PIN FUNCTION DESCRIPTION

SO−8 Pin#	SO−8 EP	Symbol	Description
1	1	V_{CC}	Supply Voltage
2	2	S_i	Input of Sense Comparator
4	4	C_T	Reset Delay Capacitor
5	5	GND	Ground
6	6	Reset	Output of Reset Comparator
7	7	S_O	Output of Sense Comparator
8	8	V_{out}	Main Regulator Output
3	3	NC	No Connect
−	EPAD	EPAD	Connect to Ground potential or leave unconnected

MAXIMUM RATINGS

Rating		Symbol	Min	Max	Unit
DC Operating Supply Voltage		V_{CC}	5.5	40	V
Input to Regulator		V_{CC}	−40	45	V
Transient Supply Voltage (Note 1)		$V_{CC\ TR}$	−	60	V
Output		V_{out} I_{out}	−0.5 −10	20 Internally Limited	V mA
Sense Input		V_{SI} I_{SI}	−40 −1.0	45 1.0	V mA
Sense Output		V_{SO} I_{SO}	−0.3 −5.0	7.0 5.0	V mA
Reset Output		V_{Reset} I_{Reset}	−0.3 −5.0	7.0 5.0	V mA
Reset Delay		V_{CT} I_{CT}	−0.3 Internally Limited	7.0 Internally Limited	V mA
ESD Protection at any pin	Human Body Model Machine Model	−	− −	4000 400	V
Operating Junction Temperature Range		T_J	−40	+150	°C
Storage Temperature Range		T_{STG}	−50	+150	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Load Dump Test B (with centralized load dump suppression) according to ISO16750-2 standard. Guaranteed by design. Not tested in production. Passed Class C according to ISO16750-1.

THERMAL CHARACTERISTICS

Characteristic		Test Conditions (Typical Values)			Unit
		Note 2	Note 3	Note 4	
SOIC−8	Junction−to−Lead (Ψ_{JLx6} θ_{JL6}) Junction−to−Ambient ($R_{\theta JA}$, θ_{JA})	65.6 169.4	62 147.6	61 127.2	°C/W
SOIC−8 EP	Junction−to−Lead (Ψ_{JL6}, θ_{JL6}) Junction−to−Ambient ($R_{\theta JA}$, θ_{JA})	36.1 109.2	32.1 91.1	27.4 71.9	°C/W

2. 1 oz. Copper, 100 mm sq. Copper area, 1.5 mm thick FR−4.
3. 1 oz. Copper, 200 mm sq. Copper area, 1.5 mm thick FR−4.
4. 1 oz. Copper, 500 mm sq. Copper area, 1.5 mm thick FR−4.

LEAD TEMPERATURE SOLDERING REFLOW (Note 5)

Rating	Symbol	Min	Max	Unit
Reflow (SMD styles only) lead free 60 − 150 sec above 217, 40 sec max at peak	Tsld	−	260	°C
Moisture Sensitivity Level (SOIC−8)	MSL	Level 1		
Moisture Sensitivity Level (SOIC−8EP)	MSL	Level 2		

5. Per IPC / JEDEC J−STD−020C.

ELECTRICAL CHARACTERISTICS (V_{CC} = 14 V, −40°C < T_J < 150°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit
Output Voltage (T_J = 25°C, I_{out} = 1.0 mA)	V_{out}	4.95	5.0	5.05	V
Output Voltage (6.0 V < V_{CC} < 28 V, 1.0 mA < I_{out} < 50 mA)	V_{out}	4.9	5.0	5.1	V
Output Voltage (V_{CC} = 35 V, t < 1.0 s, 1.0 mA < I_{out} < 50 mA)	V_{out}	4.9	5.0	5.1	V
Dropout Voltage	V_{drop}				V
I_{out} = 10 mA		–	0.08	0.25	
I_{out} = 50 mA		–	0.18	0.40	
I_{out} = 100 mA		–	0.22	0.50	
Input to Output Voltage Difference in Undervoltage Condition (V_{CC} = 4.0 V, I_{out} = 35 mA)	V_{IO}	–	0.12	0.4	V
Line Regulation (6.0 V < V_{CC} < 28 V, I_{out} = 1.0 mA)	Reg_{line}	–	1.0	20	mV
Load Regulation (1.0 mA < I_{out} < 100 mA)	Reg_{load}	–	1.0	30	mV
Current Limit	I_{Lim}				mA
V_{out} = 4.5 V		105	320	400	
V_{out} = 0 V		–	220	–	
Quiescent Current (I_{out} = 0.3 mA, T_J < 100°C)	I_{QSE}	–	120	260	μA
Quiescent Current (I_{out} = 100 mA)	I_Q	–	–	5.0	mA
RESET					
Reset Threshold Voltage	V_{Resth}	–	4.5	–	V
Reset Threshold Hysteresis	$V_{Resth,hys}$				mV
@ T_J = 25°C		50	100	200	
@ T_J = −40 to +125°C		50	–	300	
Reset Pulse Delay (C_T = 100 nF, t_R ≥ 100 μs)	t_{ResD}	55	100	180	ms
Reset Reaction Time (C_T = 100 nF)	t_{ResR}	–	5.0	30	μs
Reset Output Low Voltage (R_{Reset} = 10 kΩ to V_{out}, V_{CC} ≥ 3.0 V)	V_{ResL}	–	–	0.3	V
Reset Output High Leakage Current (V_{Reset} = 5.0 V)	I_{ResH}	–	–	1.0	μA
Delay Comparator Threshold	V_{CTth}	–	2.0	–	V
Delay Comparator Threshold Hysteresis	$V_{CTth,\ hys}$	–	100	–	mV
SENSE					
Sense Low Threshold (V_{SI} Decreasing = 1.5 V to 1.0 V)	V_{SOth}	1.16	1.25	1.35	V
Sense Threshold Hysteresis	$V_{SOth,hys}$	20	100	200	mV
Sense Output Low Voltage (V_{SI} ≤ 1.16 V, V_{CC} ≥ 3.0 V, R_{SO} = 10 kΩ to V_{out})	V_{SOL}	–	–	0.4	V
Sense Output Leakage (V_{SO} = 5.0 V, V_{SI} ≥ 1.5 V)	I_{SOH}	–	–	1.0	μA
Sense Input Current	I_{SI}	−1.0	0.1	1.0	μA
THERMAL SHUTDOWN					
Thermal Shutdown Temperature (I_{out} = 1 mA) (Note 6)	T_{SD}	150	–	200	°C

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

6. Values based on design and/or characterization.

TYPICAL CHARACTERISTICS

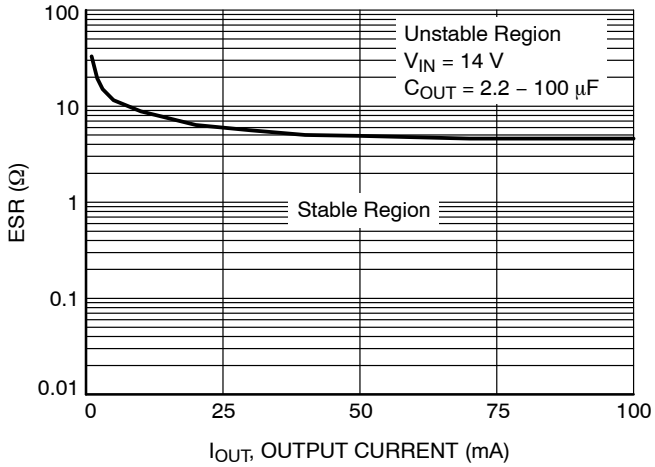


Figure 2. ESR Stability Border vs. Output Current

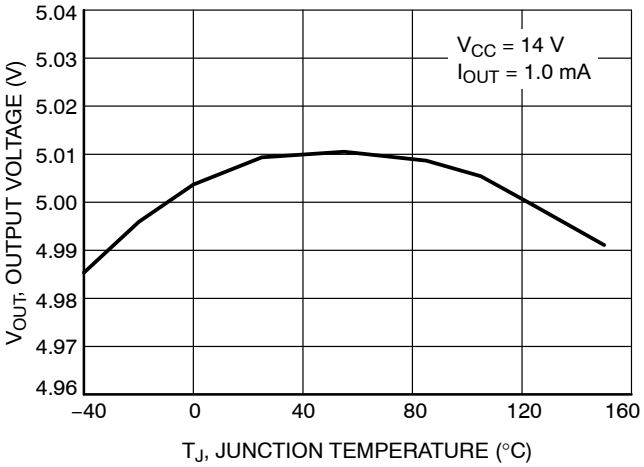


Figure 3. Output Voltage vs. Junction Temperature

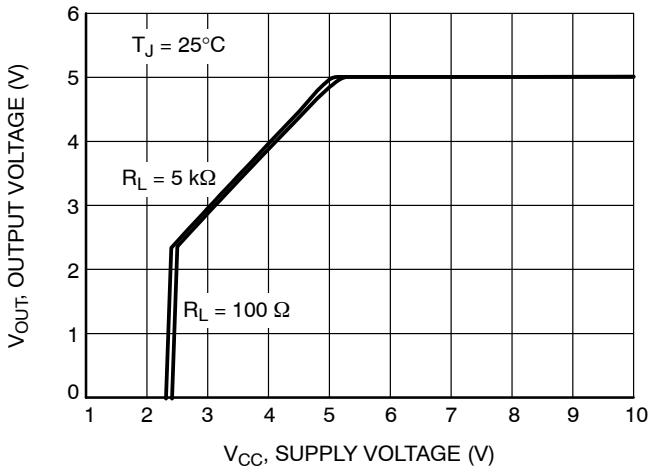


Figure 4. Output Voltage vs. Supply Voltage

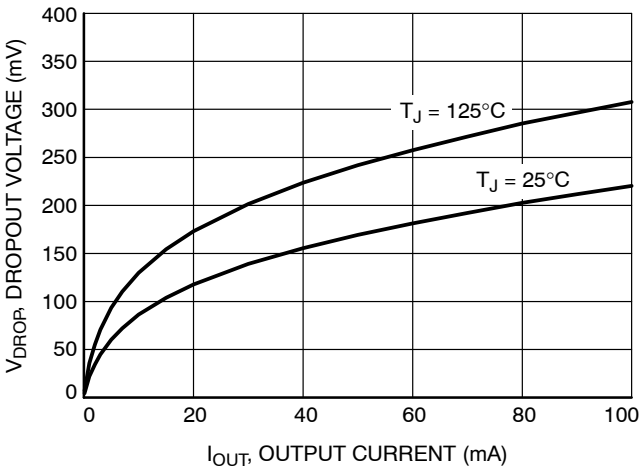


Figure 5. Dropout Voltage vs. Output Current

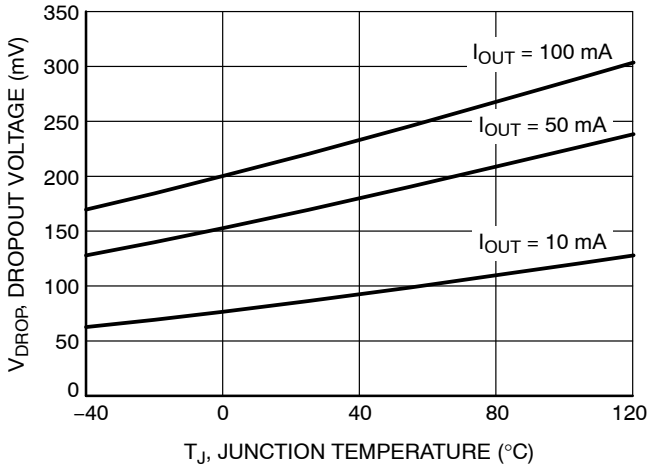


Figure 6. Dropout Voltage vs. Junction Temperature

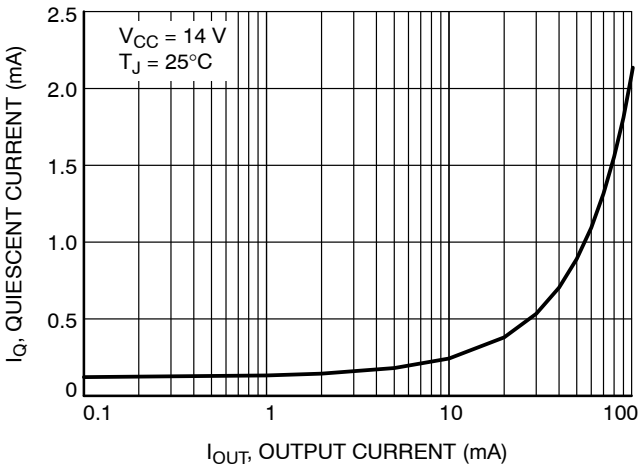


Figure 7. Quiescent Current vs. Output Current

TYPICAL CHARACTERISTICS

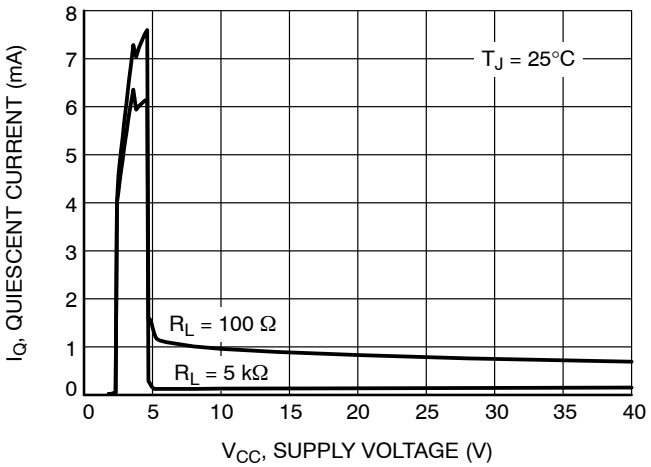


Figure 8. Quiescent Current vs. Supply Voltage

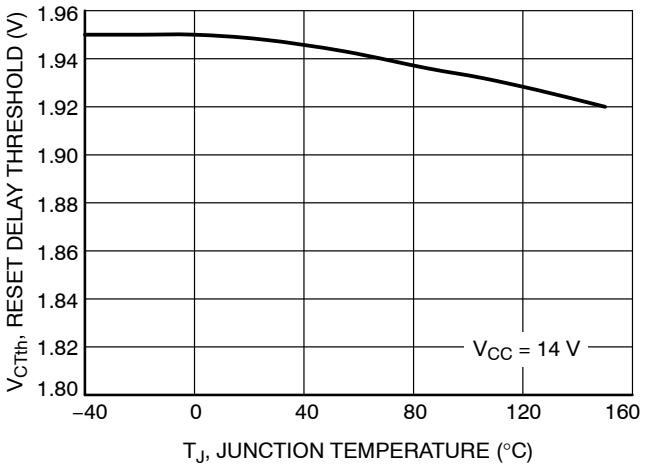


Figure 9. Reset Delay Threshold vs. Junction Temperature

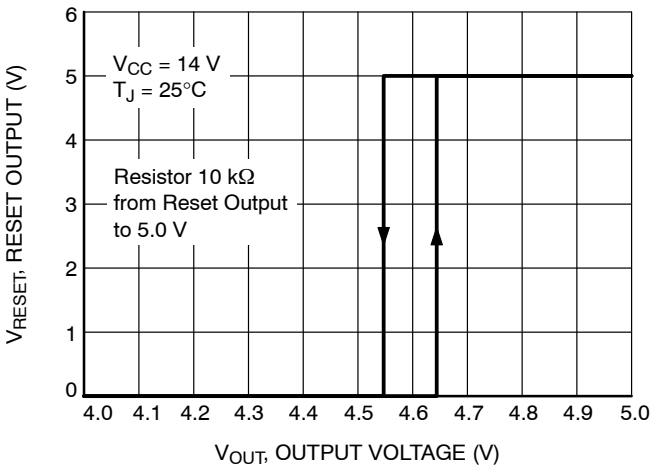


Figure 10. Reset Output vs. Regulator Output Voltage

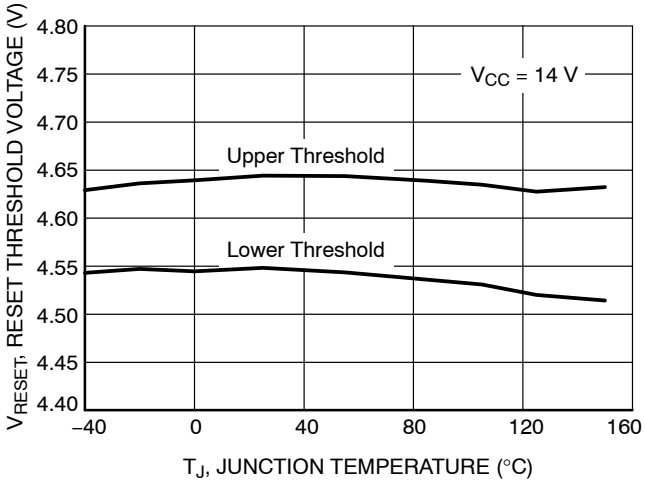


Figure 11. Reset Thresholds vs. Junction Temperature

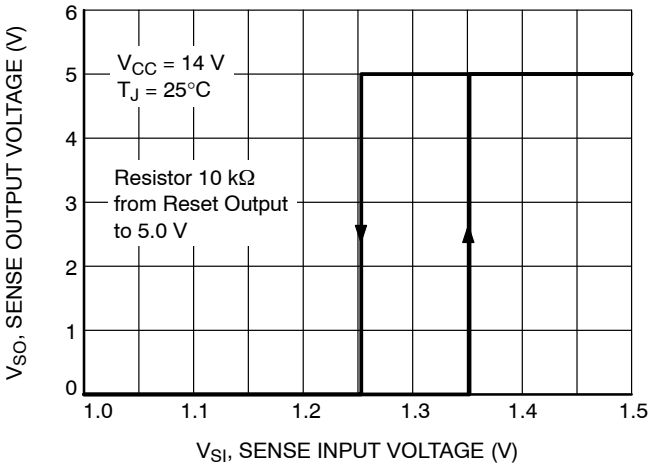


Figure 12. Sense Output vs. Sense Input Voltage

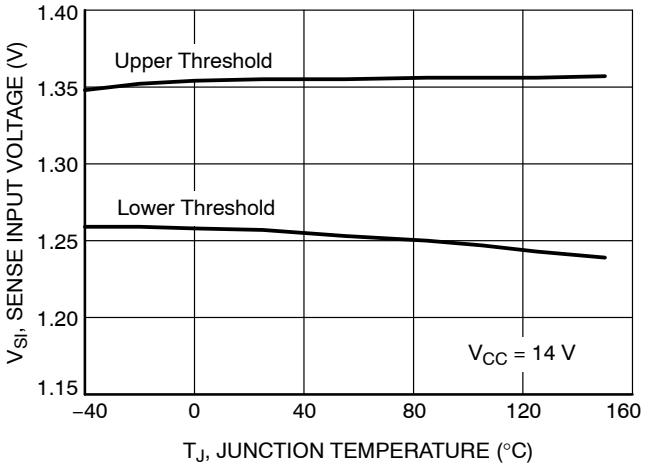
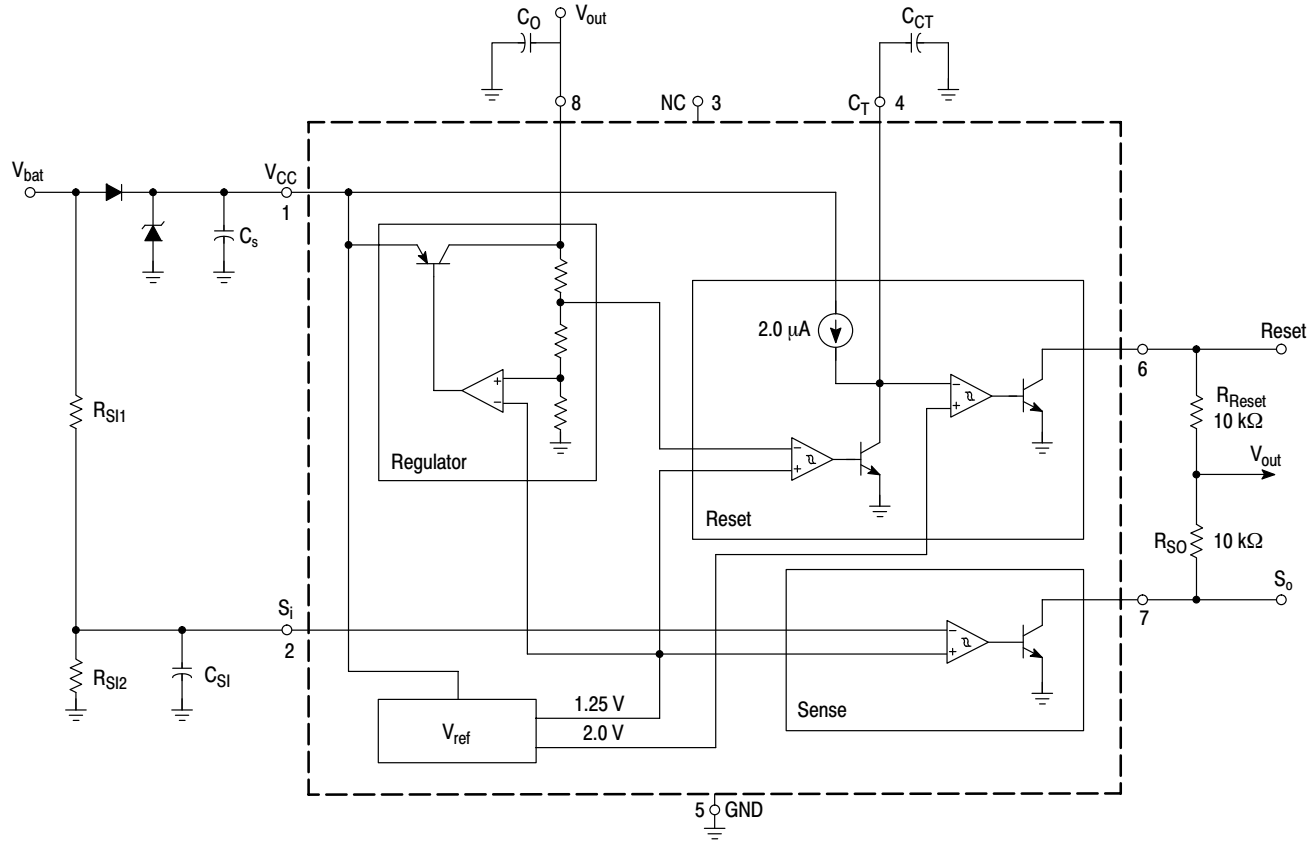


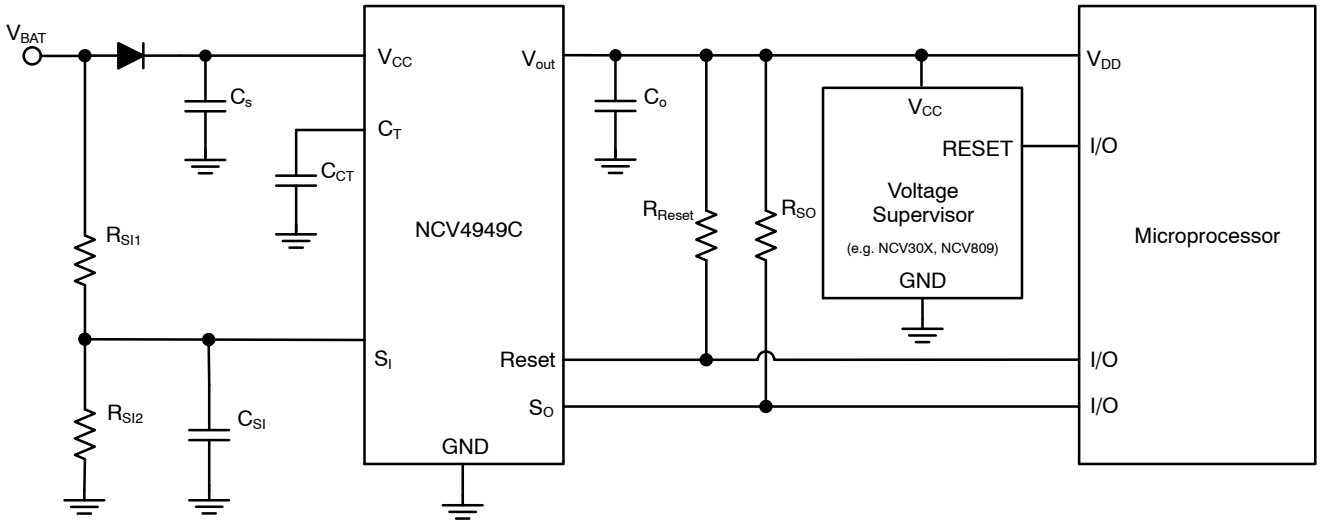
Figure 13. Sense Thresholds vs. Junction Temperature

APPLICATION INFORMATION



NOTE: 1. For good dynamic performance: $C_s \geq 1.0$ μF, $C_O \geq 4.7$ μF, ESR < 4.5 Ω at 10 kHz

Figure 14. Application Schematic



NOTE: The NCV4949C is not developed in compliance with ISO26262 standard. If application is safety critical then the above application diagram shown in Figure 15 can be used.

Figure 15. Application Diagram

OPERATING DESCRIPTION

The NCV4949C is a monolithic integrated low dropout voltage regulator. Several outstanding features and auxiliary functions are implemented to meet the requirements of supplying microprocessor systems in automotive applications. It is also suitable in other applications where the included functions are required. The modular approach of this device allows the use of other features and functions independently when required.

Voltage Regulator

The voltage regulator uses a lateral PNP transistor as a regulating element. With this structure, very low dropout voltage at currents up to 100 mA is obtained. The dropout operation of the standby regulator is maintained typically down to 2.5 V input supply voltage.

A typical curve showing the standby output voltage as a function of the input supply voltage is shown in Figure 17.

The current consumption of the device (quiescent current) is less than 200 μA.

To reduce the quiescent current peak in the undervoltage region and to improve the transient response in this region, the dropout voltage is controlled. The quiescent current as a function of the supply input voltage is shown in Figure 18.

Short Circuit Protection:

The maximum output current is internally limited. In case of short circuit, the output current is foldback current limited as described in Figure 16.

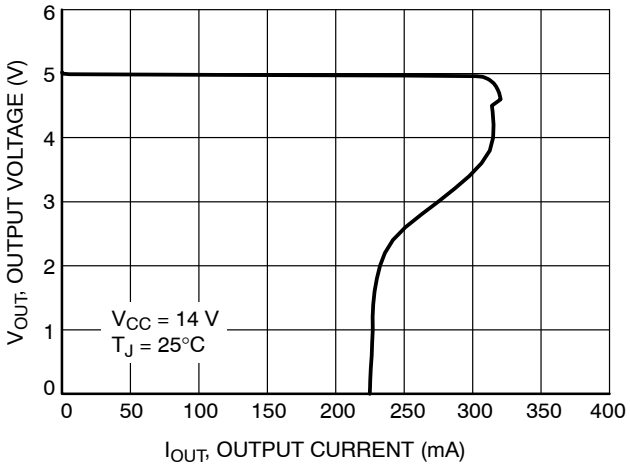


Figure 16. Foldback Characteristic of V_{out}

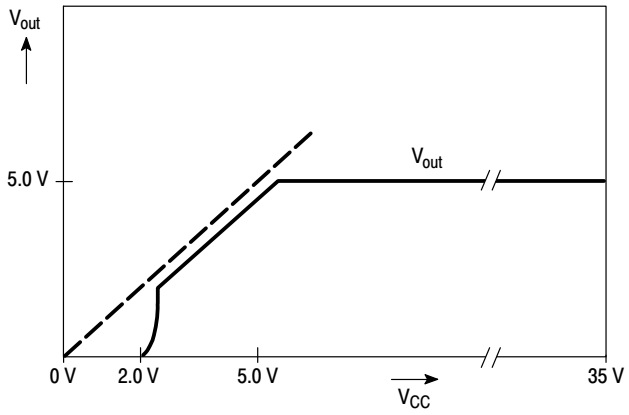


Figure 17. Output Voltage vs. Supply Voltage

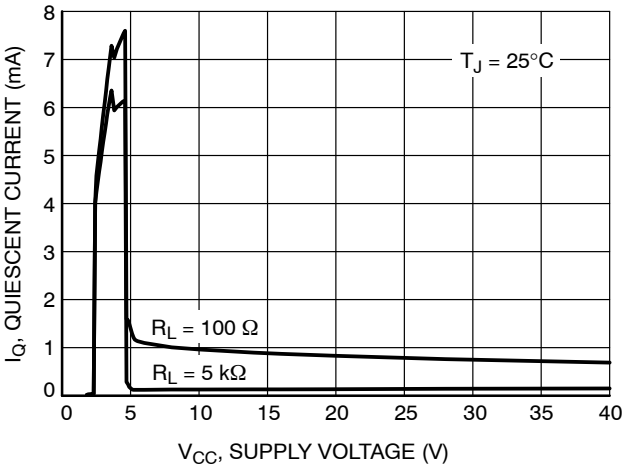


Figure 18. Quiescent Current vs. Supply Voltage

Reset Circuit

The block circuit diagram of the reset circuit is shown in Figure 19.

The reset circuit supervises the output voltage. The reset threshold of 4.5 V is defined by the internal reference voltage and standby output divider.

The reset pulse delay time t_{RD}, is defined by the charge time of an external capacitor C_T:

$$t_{RD} = \frac{C_T \times 2.0\ V}{2.0\ \mu A}$$

The reaction time of the reset circuit originates from the discharge time limitation of the reset capacitor C_T and is proportional to the value of C_T. The reaction time of the reset circuit increases the noise immunity.

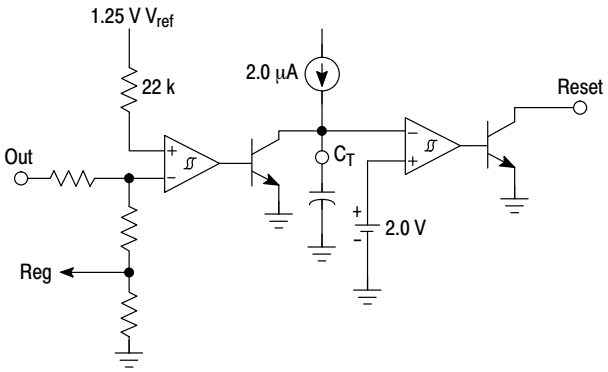


Figure 19. Reset Circuit

Output voltage drops below the reset threshold only marginally longer than the reaction time results in a shorter reset delay time.

The nominal reset delay time will be generated for output voltage drops longer than approximately 50 μs. The typical reset output waveforms are shown in Figure 20.

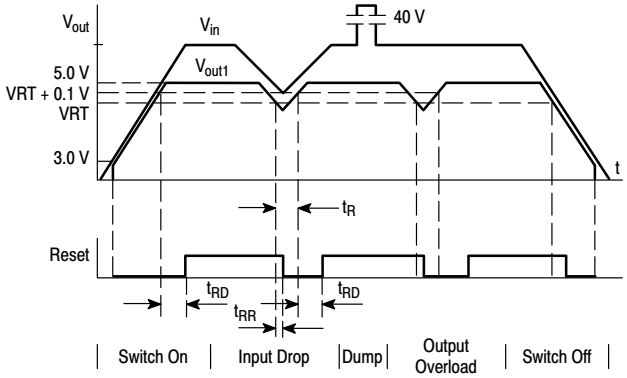


Figure 20. Typical Reset Output Waveforms

Sense Comparator

The sense comparator compares an input signal with an internal voltage reference of typical 1.25 V. The use of an external voltage divider makes this comparator very flexible in the application.

It can be used to supervise the input voltage either before or after a protection diode and to provide additional information to the microprocessor such as low voltage warnings.

ORDERING INFORMATION

Device	Package	Shipping†
NCV4949CDR2G	SOIC−8 (Pb−Free)	2500 / Tape & Reel
NCV4949CPDR2G	SOIC−8 EP (Pb−Free)	2500 / Tape & Reel

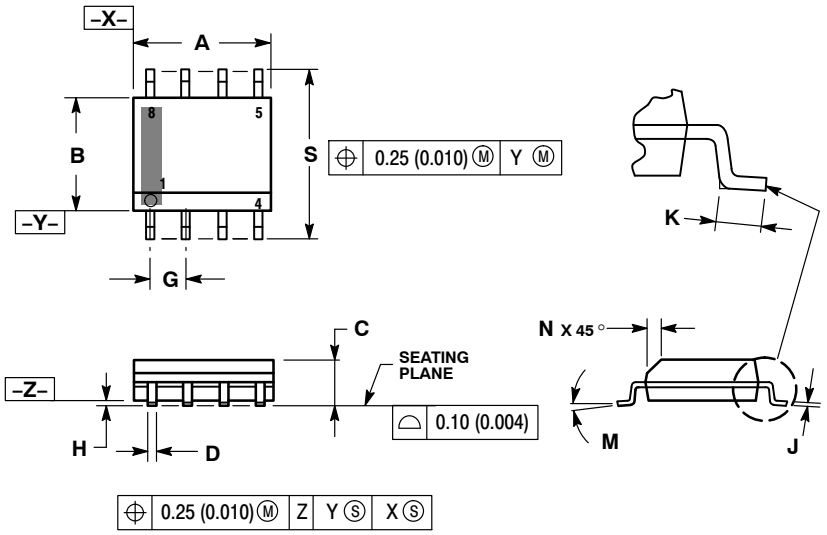
†For information on tape and reel specifications,including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

SCALE 1:1

SOIC−8 NB
CASE 751−07
ISSUE AK

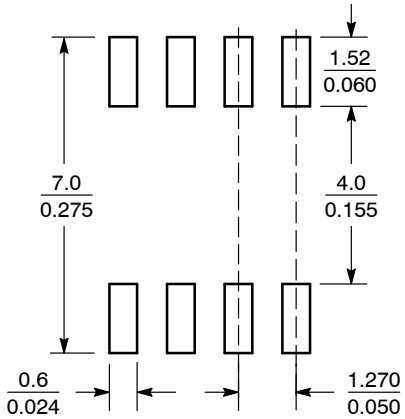
DATE 16 FEB 2011



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION A AND B DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.
6. 751−01 THRU 751−06 ARE OBSOLETE. NEW STANDARD IS 751−07.

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	4.80	5.00	0.189	0.197
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.053	0.069
D	0.33	0.51	0.013	0.020
G	1.27 BSC		0.050 BSC	
H	0.10	0.25	0.004	0.010
J	0.19	0.25	0.007	0.010
K	0.40	1.27	0.016	0.050
M	0 °	8 °	0 °	8 °
N	0.25	0.50	0.010	0.020
S	5.80	6.20	0.228	0.244

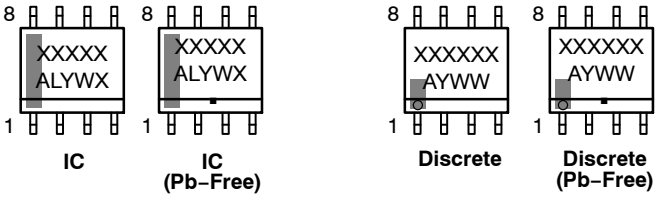
SOLDERING FOOTPRINT*



SCALE 6:1 (mm / inches)

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

GENERIC MARKING DIAGRAM*



IC | **IC (Pb−Free)** | **Discrete** | **Discrete (Pb−Free)**

XXXXX = Specific Device Code
A = Assembly Location
L = Wafer Lot
Y = Year
W = Work Week
▪ = Pb−Free Package

XXXXXX = Specific Device Code
A = Assembly Location
Y = Year
WW = Work Week
▪ = Pb−Free Package

*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.

STYLES ON PAGE 2

DOCUMENT NUMBER:	**98ASB42564B**	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.	
DESCRIPTION:	**SOIC−8 NB**		**PAGE 1 OF 2**

SOIC−8 NB
CASE 751−07
ISSUE AK

DATE 16 FEB 2011

STYLE 1:
PIN 1. EMITTER
2. COLLECTOR
3. COLLECTOR
4. EMITTER
5. EMITTER
6. BASE
7. BASE
8. EMITTER

STYLE 2:
PIN 1. COLLECTOR, DIE, #1
2. COLLECTOR, #1
3. COLLECTOR, #2
4. COLLECTOR, #2
5. BASE, #2
6. EMITTER, #2
7. BASE, #1
8. EMITTER, #1

STYLE 3:
PIN 1. DRAIN, DIE #1
2. DRAIN, #1
3. DRAIN, #2
4. DRAIN, #2
5. GATE, #2
6. SOURCE, #2
7. GATE, #1
8. SOURCE, #1

STYLE 4:
PIN 1. ANODE
2. ANODE
3. ANODE
4. ANODE
5. ANODE
6. ANODE
7. ANODE
8. COMMON CATHODE

STYLE 5:
PIN 1. DRAIN
2. DRAIN
3. DRAIN
4. DRAIN
5. GATE
6. GATE
7. SOURCE
8. SOURCE

STYLE 6:
PIN 1. SOURCE
2. DRAIN
3. DRAIN
4. SOURCE
5. SOURCE
6. GATE
7. GATE
8. SOURCE

STYLE 7:
PIN 1. INPUT
2. EXTERNAL BYPASS
3. THIRD STAGE SOURCE
4. GROUND
5. DRAIN
6. GATE 3
7. SECOND STAGE Vd
8. FIRST STAGE Vd

STYLE 8:
PIN 1. COLLECTOR, DIE #1
2. BASE, #1
3. BASE, #2
4. COLLECTOR, #2
5. COLLECTOR, #2
6. EMITTER, #2
7. EMITTER, #1
8. COLLECTOR, #1

STYLE 9:
PIN 1. EMITTER, COMMON
2. COLLECTOR, DIE #1
3. COLLECTOR, DIE #2
4. EMITTER, COMMON
5. EMITTER, COMMON
6. BASE, DIE #2
7. BASE, DIE #1
8. EMITTER, COMMON

STYLE 10:
PIN 1. GROUND
2. BIAS 1
3. OUTPUT
4. GROUND
5. GROUND
6. BIAS 2
7. INPUT
8. GROUND

STYLE 11:
PIN 1. SOURCE 1
2. GATE 1
3. SOURCE 2
4. GATE 2
5. DRAIN 2
6. DRAIN 2
7. DRAIN 1
8. DRAIN 1

STYLE 12:
PIN 1. SOURCE
2. SOURCE
3. SOURCE
4. GATE
5. DRAIN
6. DRAIN
7. DRAIN
8. DRAIN

STYLE 13:
PIN 1. N.C.
2. SOURCE
3. SOURCE
4. GATE
5. DRAIN
6. DRAIN
7. DRAIN
8. DRAIN

STYLE 14:
PIN 1. N−SOURCE
2. N−GATE
3. P−SOURCE
4. P−GATE
5. P−DRAIN
6. P−DRAIN
7. N−DRAIN
8. N−DRAIN

STYLE 15:
PIN 1. ANODE 1
2. ANODE 1
3. ANODE 1
4. ANODE 1
5. CATHODE, COMMON
6. CATHODE, COMMON
7. CATHODE, COMMON
8. CATHODE, COMMON

STYLE 16:
PIN 1. EMITTER, DIE #1
2. BASE, DIE #1
3. EMITTER, DIE #2
4. BASE, DIE #2
5. COLLECTOR, DIE #2
6. COLLECTOR, DIE #2
7. COLLECTOR, DIE #1
8. COLLECTOR, DIE #1

STYLE 17:
PIN 1. VCC
2. V2OUT
3. V1OUT
4. TXE
5. RXE
6. VEE
7. GND
8. ACC

STYLE 18:
PIN 1. ANODE
2. ANODE
3. SOURCE
4. GATE
5. DRAIN
6. DRAIN
7. CATHODE
8. CATHODE

STYLE 19:
PIN 1. SOURCE 1
2. GATE 1
3. SOURCE 2
4. GATE 2
5. DRAIN 2
6. MIRROR 2
7. DRAIN 1
8. MIRROR 1

STYLE 20:
PIN 1. SOURCE (N)
2. GATE (N)
3. SOURCE (P)
4. GATE (P)
5. DRAIN
6. DRAIN
7. DRAIN
8. DRAIN

STYLE 21:
PIN 1. CATHODE 1
2. CATHODE 2
3. CATHODE 3
4. CATHODE 4
5. CATHODE 5
6. COMMON ANODE
7. COMMON ANODE
8. CATHODE 6

STYLE 22:
PIN 1. I/O LINE 1
2. COMMON CATHODE/VCC
3. COMMON CATHODE/VCC
4. I/O LINE 3
5. COMMON ANODE/GND
6. I/O LINE 4
7. I/O LINE 5
8. COMMON ANODE/GND

STYLE 23:
PIN 1. LINE 1 IN
2. COMMON ANODE/GND
3. COMMON ANODE/GND
4. LINE 2 IN
5. LINE 2 OUT
6. COMMON ANODE/GND
7. COMMON ANODE/GND
8. LINE 1 OUT

STYLE 24:
PIN 1. BASE
2. EMITTER
3. COLLECTOR/ANODE
4. COLLECTOR/ANODE
5. CATHODE
6. CATHODE
7. COLLECTOR/ANODE
8. COLLECTOR/ANODE

STYLE 25:
PIN 1. VIN
2. N/C
3. REXT
4. GND
5. IOUT
6. IOUT
7. IOUT
8. IOUT

STYLE 26:
PIN 1. GND
2. dv/dt
3. ENABLE
4. ILIMIT
5. SOURCE
6. SOURCE
7. SOURCE
8. VCC

STYLE 27:
PIN 1. ILIMIT
2. OVLO
3. UVLO
4. INPUT+
5. SOURCE
6. SOURCE
7. SOURCE
8. DRAIN

STYLE 28:
PIN 1. SW_TO_GND
2. DASIC_OFF
3. DASIC_SW_DET
4. GND
5. V_MON
6. VBULK
7. VBULK
8. VIN

STYLE 29:
PIN 1. BASE, DIE #1
2. EMITTER, #1
3. BASE, #2
4. EMITTER, #2
5. COLLECTOR, #2
6. COLLECTOR, #2
7. COLLECTOR, #1
8. COLLECTOR, #1

STYLE 30:
PIN 1. DRAIN 1
2. DRAIN 1
3. GATE 2
4. SOURCE 2
5. SOURCE 1/DRAIN 2
6. SOURCE 1/DRAIN 2
7. SOURCE 1/DRAIN 2
8. GATE 1

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DESCRIPTION:	**SOIC−8 NB**		**PAGE 2 OF 2**

MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

ON Semiconductor®

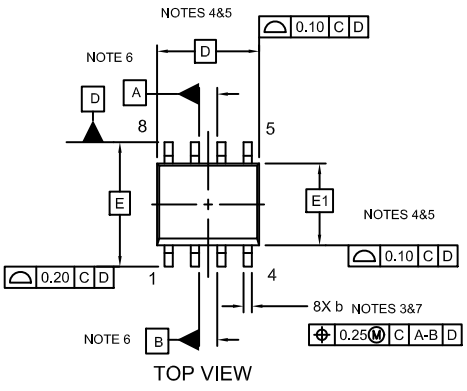
SCALE 1:1

SOIC−8 EP
CASE 751AC
ISSUE D

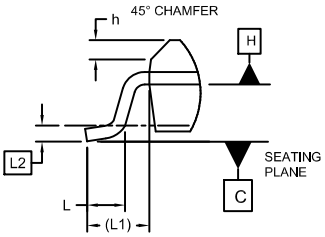
DATE 02 APR 2019

NOTES:

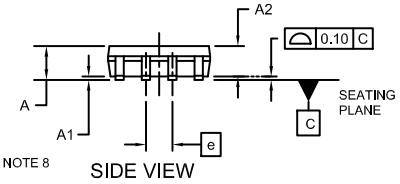
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS
3. DIMENSION b DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE PROTRUSION SHALL BE 0.004 IN EXCESS OF MAXIMUM MATERIAL CONDITION.
4. DIMENSION D DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS. MOLD FLASH, PROTRUSIONS, OR GATE BURRS SHALL NOT EXCEED 0.006 PER SIDE. DIMENSION E1 DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION. INTERLEAD FLASH OR PROTRUSION SHALL NOT EXCEED 0.010 mm PER SIDE.
5. THE PACKAGE TOP MAY BE SMALLER THAN THE PACKAGE BOTTOM. DIMENSIONS D AND E1 ARE DETERMINED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY AT DATUM H.
6. DATUMS A AND B ARE TO BE DETERMINED AT DATUM H.
7. DIMENSIONS b AND c APPLY TO THE FLAT SECTION OF THE LEAD BETWEEN 0.10 TO 0.25 FROM THE LEAD TIP.
8. A1 IS DEFINED AS THE VERTICAL DISTANCE FROM THE SEATING PLANE TO THE LOWEST POINT ON THE PACKAGE BODY.



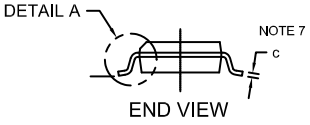
TOP VIEW



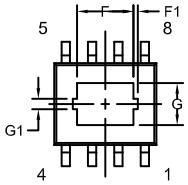
DETAIL A



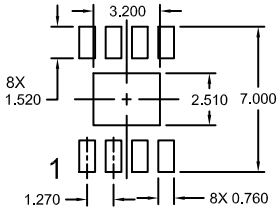
SIDE VIEW



END VIEW



BOTTOM VIEW

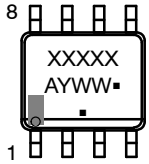


RECOMMENDED
MOUNTING FOOTPRINT*

DIM	MILLIMETERS		
	MIN.	NOM..	MAX.
A	1.35	1.55	1.75
A1	−−	0.05	0.10
A2	1.35	1.50	1.65
b	0.31	0.41	0.51
c	0.17	0.21	0.23
D	4.90 BSC		
E	6.00 BSC		
E1	3.90 BSC		
e	1.27 BSC		
F	2.24	2.72	3.20
F1	0.15	0.20	0.25
G	1.55	2.03	2.51
G1	0.41	0.46	0.51
h	0.25	0.38	0.50
L	0.40	0.84	1.27
L1	1.04 REF		
L2	0.25 REF		
Ø	0°	4°	8°

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

GENERIC MARKING DIAGRAM*



XXXXXX = Specific Device Code
A = Assembly Location
Y = Year
WW = Work Week
▪ = Pb−Free Package

*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 and may be in either location. Some products may not follow the Generic Marking.

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