

DATA SHEET

74AHC3G14; 74AHCT3G14 Inverting Schmitt trigger

Product specification
Supersedes data of 2003 Nov 27

2004 Oct 18

Inverting Schmitt trigger

74AHC3G14; 74AHCT3G14

FEATURES

- Symmetrical output impedance
- High noise immunity
- ESD protection:
 - HBM EIA/JESD22-A114-B exceeds 2000 V
 - MM EIA/JESD22-A115-A exceeds 200 V
 - CDM EIA/JESD22-C101 exceeds 500 V.
- Low power dissipation
- Balanced propagation delays
- Multiple package options
- Specified from $-40\text{ }^{\circ}\text{C}$ to $+85\text{ }^{\circ}\text{C}$ and $-40\text{ }^{\circ}\text{C}$ to $+125\text{ }^{\circ}\text{C}$.

APPLICATIONS

- Wave and pulse shapers
- Astable multivibrators
- Monostable multivibrators.

DESCRIPTION

The 74AHC3G/AHCT3G14 is a high-speed Si-gate CMOS device.

The 74AHC3G/AHCT3G14 provides three inverting buffers with Schmitt-trigger action. These devices are capable of transforming slowly changing input signals into sharply defined, jitter-free output signals.

QUICK REFERENCE DATA

GND = 0 V; $T_{\text{amb}} = 25\text{ }^{\circ}\text{C}$; $t_r = t_f \leq 3.0\text{ ns}$.

| SYMBOL | PARAMETER | CONDITIONS | TYPICAL | | UNIT |
|---------------------------------|-------------------------------|---|---------|----------|------|
| | | | AHC3G14 | AHCT3G14 | |
| $t_{\text{PHL}}/t_{\text{PLH}}$ | propagation delay A to Y | $C_L = 15\text{ pF}$; $V_{\text{CC}} = 5\text{ V}$ | 3.2 | 4.1 | ns |
| C_I | input capacitance | | 1.5 | 1.5 | pF |
| C_{PD} | power dissipation capacitance | $C_L = 15\text{ pF}$; $f = 1\text{ MHz}$; notes 1 and 2 | 10 | 12 | pF |

Notes

1. C_{PD} is used to determine the dynamic power dissipation (P_D in μW).

$$P_D = C_{\text{PD}} \times V_{\text{CC}}^2 \times f_i \times N + \Sigma(C_L \times V_{\text{CC}}^2 \times f_o) \text{ where:}$$

f_i = input frequency in MHz;

f_o = output frequency in MHz;

C_L = output load capacitance in pF;

V_{CC} = supply voltage in Volts;

N = number of inputs switching;

$\Sigma(C_L \times V_{\text{CC}}^2 \times f_o)$ = sum of the outputs.

2. The condition is $V_I = \text{GND to } V_{\text{CC}}$.

FUNCTION TABLE

See note 1.

| INPUT | OUTPUT |
|-------|--------|
| nA | nY |
| L | H |
| H | L |

Note

1. H = HIGH voltage level;
L = LOW voltage level.

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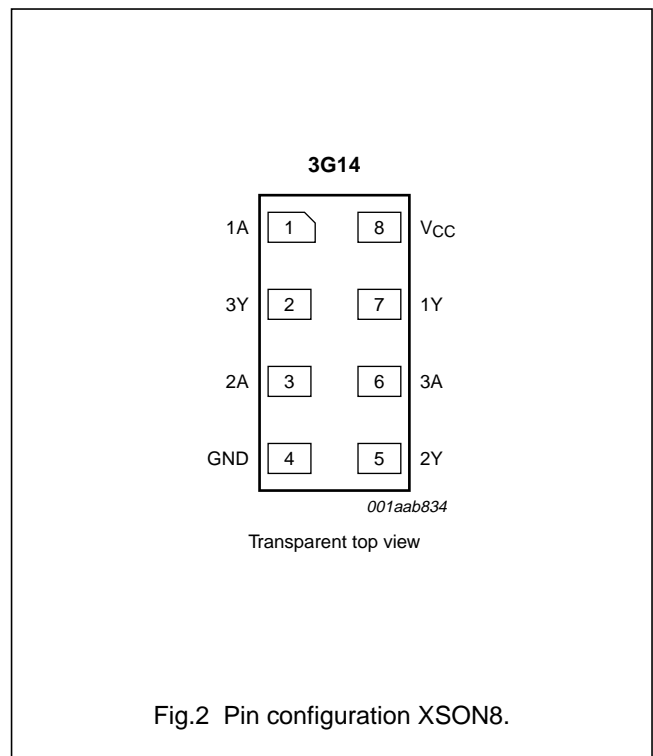
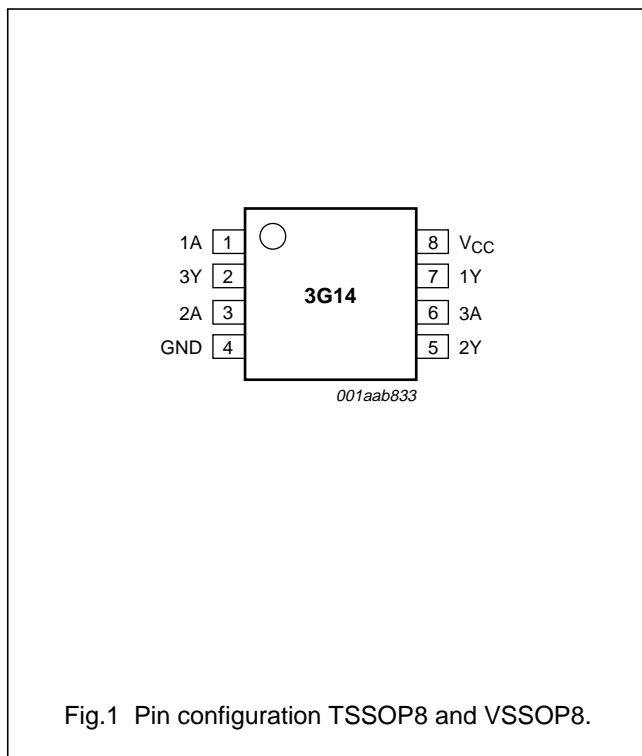
74AHC3G14; 74AHCT3G14

ORDERING INFORMATION

| TYPE NUMBER | PACKAGE | | | | | |
|--------------|-------------------|------|---------|----------|----------|---------|
| | TEMPERATURE RANGE | PINS | PACKAGE | MATERIAL | CODE | MARKING |
| 74AHC3G14DP | -40 °C to +125 °C | 8 | TSSOP8 | plastic | SOT505-2 | A14 |
| 74AHCT3G14DP | -40 °C to +125 °C | 8 | TSSOP8 | plastic | SOT505-2 | C14 |
| 74AHC3G14DC | -40 °C to +125 °C | 8 | VSSOP8 | plastic | SOT765-1 | A14 |
| 74AHCT3G14DC | -40 °C to +125 °C | 8 | VSSOP8 | plastic | SOT765-1 | C14 |
| 74AHC3G14GM | -40 °C to +125 °C | 8 | XSON8 | plastic | SOT833-1 | A14 |
| 74AHCT3G14GM | -40 °C to +125 °C | 8 | XSON8 | plastic | SOT833-1 | C14 |

PINNING

| PIN | SYMBOL | DESCRIPTION |
|-----|-----------------|----------------|
| 1 | 1A | data input |
| 2 | 3Y | data output |
| 3 | 2A | data input |
| 4 | GND | ground (0 V) |
| 5 | 2Y | data output |
| 6 | 3A | data input |
| 7 | 1Y | data output |
| 8 | V _{CC} | supply voltage |



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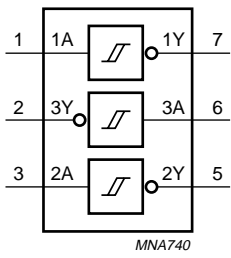


Fig.3 Logic symbol.

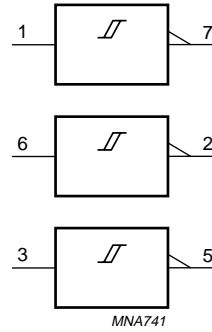


Fig.4 IEC logic symbol.

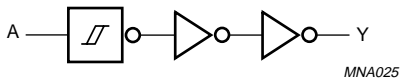


Fig.5 Logic diagram (one driver).

Inverting Schmitt trigger

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RECOMMENDED OPERATING CONDITIONS

| SYMBOL | PARAMETER | CONDITIONS | 74AHC3G | | | 74AHCT3G | | | UNIT |
|-----------|-------------------------------|--|---------|------|----------|----------|------|----------|------|
| | | | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. | |
| V_{CC} | supply voltage | | 2.0 | 5.0 | 5.5 | 4.5 | 5.0 | 5.5 | V |
| V_I | input voltage | | 0 | – | 5.5 | 0 | – | 5.5 | V |
| V_O | output voltage | | 0 | – | V_{CC} | 0 | – | V_{CC} | V |
| T_{amb} | operating ambient temperature | see DC and AC characteristics per device | –40 | +25 | +125 | –40 | +25 | +125 | °C |

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134); voltages are referenced to GND (ground = 0 V).

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|-------------------|-------------------------------|--|------|------|------|
| V_{CC} | supply voltage | | –0.5 | +7.0 | V |
| V_I | input voltage | | –0.5 | +7.0 | V |
| I_{IK} | input diode current | $V_I < -0.5$ V | – | –20 | mA |
| I_{OK} | output diode current | $V_O < -0.5$ V or $V_O > V_{CC} + 0.5$ V; note 1 | – | ±20 | mA |
| I_O | output source or sink current | -0.5 V < V_O < $V_{CC} + 0.5$ V | – | ±25 | mA |
| I_{CC}, I_{GND} | V_{CC} or GND current | | – | ±75 | mA |
| T_{stg} | storage temperature | | –65 | +150 | °C |
| P_D | power dissipation | $T_{amb} = -40$ °C to +125 °C | – | 250 | mW |

Note

1. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

Inverting Schmitt trigger

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DC CHARACTERISTICS

Type 74AHC3G14

At recommended operating conditions; voltages are referenced to GND (ground = 0 V).

| SYMBOL | PARAMETER | TEST CONDITIONS | | MIN. | TYP. | MAX. | UNIT |
|---|---------------------------|---|---------------------|------|------|------|------|
| | | OTHER | V _{CC} (V) | | | | |
| T_{amb} = 25 °C | | | | | | | |
| V _{OH} | HIGH-level output voltage | V _I = V _{IH} or V _{IL} | | | | | |
| | | I _O = -50 μA | 2.0 | 1.9 | 2.0 | - | V |
| | | I _O = -50 μA | 3.0 | 2.9 | 3.0 | - | V |
| | | I _O = -50 μA | 4.5 | 4.4 | 4.5 | - | V |
| | | I _O = -4.0 mA | 3.0 | 2.58 | - | - | V |
| | | I _O = -8.0 mA | 4.5 | 3.94 | - | - | V |
| V _{OL} | LOW-level output voltage | V _I = V _{IH} or V _{IL} | | | | | |
| | | I _O = 50 μA | 2.0 | - | 0 | 0.1 | V |
| | | I _O = 50 μA | 3.0 | - | 0 | 0.1 | V |
| | | I _O = 50 μA | 4.5 | - | 0 | 0.1 | V |
| | | I _O = 4.0 mA | 3.0 | - | - | 0.36 | V |
| | | I _O = 8.0 mA | 4.5 | - | - | 0.36 | V |
| I _{LI} | input leakage current | V _I = V _{CC} or GND | 5.5 | - | - | 0.1 | μA |
| I _{CC} | quiescent supply current | V _I = V _{CC} or GND; I _O = 0 A | 5.5 | - | - | 1.0 | μA |
| C _I | input capacitance | | - | - | 1.5 | 10 | pF |
| T_{amb} = -40 °C to +85 °C | | | | | | | |
| V _{OH} | HIGH-level output voltage | V _I = V _{IH} or V _{IL} | | | | | |
| | | I _O = -50 μA | 2.0 | 1.9 | - | - | V |
| | | I _O = -50 μA | 3.0 | 2.9 | - | - | V |
| | | I _O = -50 μA | 4.5 | 4.4 | - | - | V |
| | | I _O = -4.0 mA | 3.0 | 2.48 | - | - | V |
| | | I _O = -8.0 mA | 4.5 | 3.8 | - | - | V |
| V _{OL} | LOW-level output voltage | V _I = V _{IH} or V _{IL} | | | | | |
| | | I _O = 50 μA | 2.0 | - | - | 0.1 | V |
| | | I _O = 50 μA | 3.0 | - | - | 0.1 | V |
| | | I _O = 50 μA | 4.5 | - | - | 0.1 | V |
| | | I _O = 4.0 mA | 3.0 | - | - | 0.44 | V |
| | | I _O = 8.0 mA | 4.5 | - | - | 0.44 | V |
| I _{LI} | input leakage current | V _I = V _{CC} or GND | 5.5 | - | - | 1.0 | μA |
| I _{CC} | quiescent supply current | V _I = V _{CC} or GND; I _O = 0 A | 5.5 | - | - | 10 | μA |
| C _I | input capacitance | | - | - | - | 10 | pF |

Inverting Schmitt trigger

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| SYMBOL | PARAMETER | TEST CONDITIONS | | MIN. | TYP. | MAX. | UNIT |
|--|---------------------------|--|---------------------|------|------|------|------|
| | | OTHER | V _{CC} (V) | | | | |
| T_{amb} = -40 °C to +125 °C | | | | | | | |
| V _{OH} | HIGH-level output voltage | V _I = V _{IH} or V _{IL} I _O = -50 µA | 2.0 | 1.9 | - | - | V |
| | | I _O = -50 µA | 3.0 | 2.9 | - | - | V |
| | | I _O = -50 µA | 4.5 | 4.4 | - | - | V |
| | | I _O = -4.0 mA | 3.0 | 2.40 | - | - | V |
| | | I _O = -8.0 mA | 4.5 | 3.70 | - | - | V |
| V _{OL} | LOW-level output voltage | V _I = V _{IH} or V _{IL} I _O = 50 µA | 2.0 | - | - | 0.1 | V |
| | | I _O = 50 µA | 3.0 | - | - | 0.1 | V |
| | | I _O = 50 µA | 4.5 | - | - | 0.1 | V |
| | | I _O = 4.0 mA | 3.0 | - | - | 0.55 | V |
| | | I _O = 8.0 mA | 4.5 | - | - | 0.55 | V |
| I _{LI} | input leakage current | V _I = V _{CC} or GND | 5.5 | - | - | 2.0 | µA |
| I _{CC} | quiescent supply current | V _I = V _{CC} or GND; I _O = 0 A | 5.5 | - | - | 40 | µA |
| C _I | input capacitance | | - | - | - | 10 | pF |

Inverting Schmitt trigger

74AHC3G14; 74AHCT3G14

Type 74AHCT3G14

At recommended operating conditions; voltages are referenced to GND (ground = 0 V).

| SYMBOL | PARAMETER | TEST CONDITIONS | | MIN. | TYP. | MAX. | UNIT |
|--|---|--|---------------------|------|------|------|------|
| | | OTHER | V _{CC} (V) | | | | |
| T_{amb} = 25 °C | | | | | | | |
| V _{OH} | HIGH-level output voltage | V _I = V _{IH} or V _{IL} | 4.5 | 4.4 | 4.5 | – | V |
| | | I _O = –50 µA I _O = –8.0 mA | 4.5 | 3.94 | – | – | V |
| V _{OL} | LOW-level output voltage | V _I = V _{IH} or V _{IL} | 4.5 | – | 0 | 0.1 | V |
| | | I _O = 50 µA I _O = 8.0 mA | 4.5 | – | – | 0.36 | V |
| I _{LI} | input leakage current | V _I = V _{IH} or V _{IL} | 5.5 | – | – | 0.1 | µA |
| I _{CC} | quiescent supply current | V _I = V _{CC} or GND; I _O = 0 A | 5.5 | – | – | 1.0 | µA |
| ΔI _{CC} | additional quiescent supply current per input pin | V _I = 3.4 V; other inputs at V _{CC} or GND; I _O = 0 A | 5.5 | – | – | 1.35 | mA |
| C _I | input capacitance | | – | – | 1.5 | 10 | pF |
| T_{amb} = –40 °C to +85 °C | | | | | | | |
| V _{OH} | HIGH-level output voltage | V _I = V _{IH} or V _{IL} | 4.5 | 4.4 | – | – | V |
| | | I _O = –50 µA I _O = –8.0 mA | 4.5 | 3.8 | – | – | V |
| V _{OL} | LOW-level output voltage | V _I = V _{IH} or V _{IL} | 4.5 | – | – | 0.1 | V |
| | | I _O = 50 µA I _O = 8.0 mA | 4.5 | – | – | 0.44 | V |
| I _{LI} | input leakage current | V _I = V _{IH} or V _{IL} | 5.5 | – | – | 1.0 | µA |
| I _{CC} | quiescent supply current | V _I = V _{CC} or GND; I _O = 0 A | 5.5 | – | – | 10 | µA |
| ΔI _{CC} | additional quiescent supply current per input pin | V _I = 3.4 V; other inputs at V _{CC} or GND; I _O = 0 A | 5.5 | – | – | 1.5 | mA |
| C _I | input capacitance | | – | – | – | 10 | pF |
| T_{amb} = –40 °C to +125 °C | | | | | | | |
| V _{OH} | HIGH-level output voltage | V _I = V _{IH} or V _{IL} | 4.5 | 4.4 | – | – | V |
| | | I _O = –50 µA I _O = –8.0 mA | 4.5 | 3.70 | – | – | V |
| V _{OL} | LOW-level output voltage | V _I = V _{IH} or V _{IL} | 4.5 | – | – | 0.1 | V |
| | | I _O = 50 µA I _O = 8.0 mA | 4.5 | – | – | 0.55 | V |
| I _{LI} | input leakage current | V _I = V _{IH} or V _{IL} | 5.5 | – | – | 2.0 | µA |
| I _{CC} | quiescent supply current | V _I = V _{CC} or GND; I _O = 0 A | 5.5 | – | – | 40 | µA |
| ΔI _{CC} | additional quiescent supply current per input pin | V _I = 3.4 V; other inputs at V _{CC} or GND; I _O = 0 A | 5.5 | – | – | 1.5 | mA |
| C _I | input capacitance | | – | – | – | 10 | pF |

Inverting Schmitt trigger

74AHC3G14; 74AHCT3G14

TRANSFER CHARACTERISTICS

Type 74AHC3G14

At recommended operating conditions; voltages are referenced to GND (ground = 0 V).

| SYMBOL | PARAMETER | TEST CONDITIONS | | MIN. | TYP. | MAX. | UNIT |
|--|---|------------------|---------------------|------|------|------|------|
| | | WAVEFORMS | V _{CC} (V) | | | | |
| T_{amb} = 25 °C | | | | | | | |
| V _{T+} | positive-going threshold | see Figs 6 and 7 | 3.0 | – | – | 2.2 | V |
| | | | 4.5 | – | – | 3.15 | V |
| | | | 5.5 | – | – | 3.85 | V |
| V _{T-} | negative-going threshold | see Figs 6 and 7 | 3.0 | 0.9 | – | – | V |
| | | | 4.5 | 1.35 | – | – | V |
| | | | 5.5 | 1.65 | – | – | V |
| V _H | hysteresis (V _{T+} – V _{T-}) | see Figs 6 and 7 | 3.0 | 0.3 | – | 1.2 | V |
| | | | 4.5 | 0.4 | – | 1.4 | V |
| | | | 5.5 | 0.5 | – | 1.6 | V |
| T_{amb} = –40 °C to +85 °C | | | | | | | |
| V _{T+} | positive-going threshold | see Figs 6 and 7 | 3.0 | – | – | 2.2 | V |
| | | | 4.5 | – | – | 3.15 | V |
| | | | 5.5 | – | – | 3.85 | V |
| V _{T-} | negative-going threshold | see Figs 6 and 7 | 3.0 | 0.9 | – | – | V |
| | | | 4.5 | 1.35 | – | – | V |
| | | | 5.5 | 1.65 | – | – | V |
| V _H | hysteresis (V _{T+} – V _{T-}) | see Figs 6 and 7 | 3.0 | 0.3 | – | 1.2 | V |
| | | | 4.5 | 0.4 | – | 1.4 | V |
| | | | 5.5 | 0.5 | – | 1.6 | V |
| T_{amb} = –40 °C to +125 °C | | | | | | | |
| V _{T+} | positive-going threshold | see Figs 6 and 7 | 3.0 | – | – | 2.2 | V |
| | | | 4.5 | – | – | 3.15 | V |
| | | | 5.5 | – | – | 3.85 | V |
| V _{T-} | negative-going threshold | see Figs 6 and 7 | 3.0 | 0.9 | – | – | V |
| | | | 4.5 | 1.35 | – | – | V |
| | | | 5.5 | 1.65 | – | – | V |
| V _H | hysteresis (V _{T+} – V _{T-}) | see Figs 6 and 7 | 3.0 | 0.25 | – | 1.2 | V |
| | | | 4.5 | 0.35 | – | 1.4 | V |
| | | | 5.5 | 0.45 | – | 1.6 | V |

Inverting Schmitt trigger

74AHC3G14; 74AHCT3G14

Type 74AHCT3G14

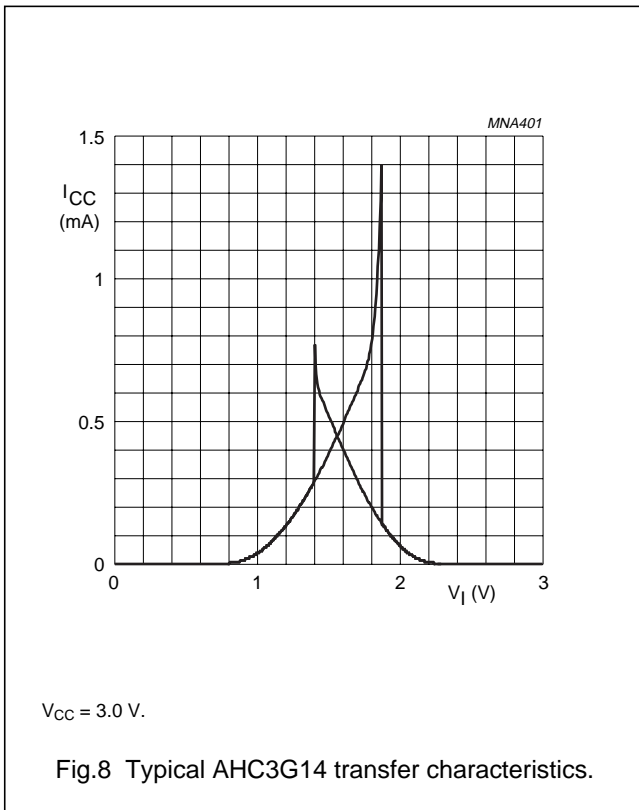
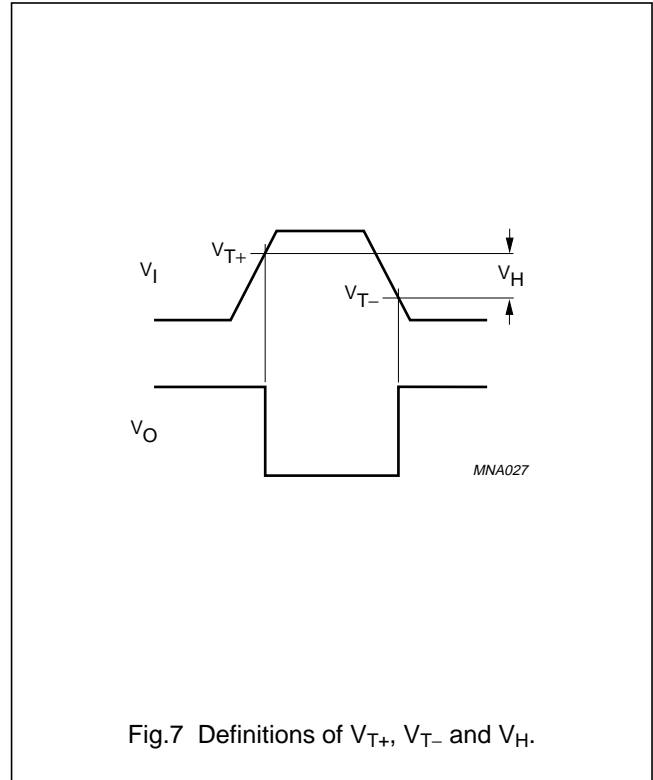
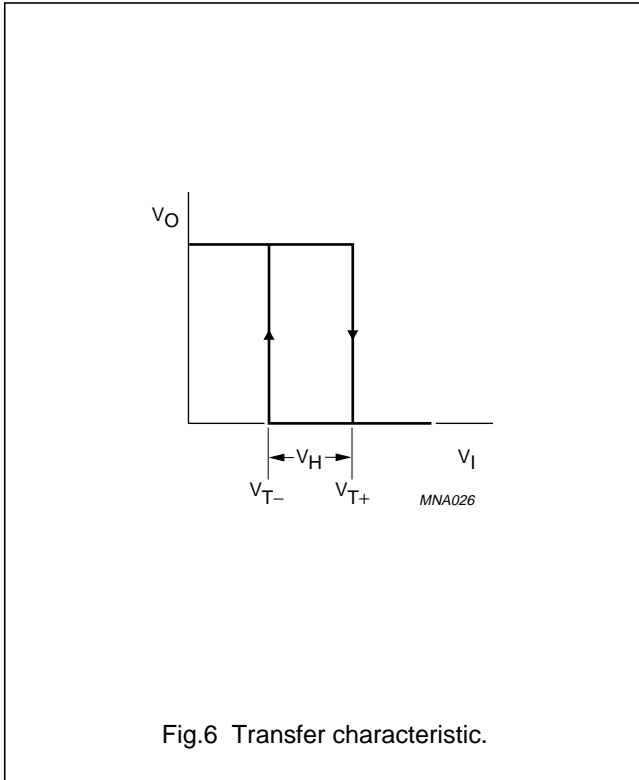
At recommended operating conditions; voltages are referenced to GND (ground = 0 V).

| SYMBOL | PARAMETER | TEST CONDITIONS | | MIN. | TYP. | MAX. | UNIT |
|--|---|------------------|---------------------|------|------|------|------|
| | | WAVEFORMS | V _{CC} (V) | | | | |
| T_{amb} = 25 °C | | | | | | | |
| V _{T+} | positive-going threshold | see Figs 6 and 7 | 4.5 | – | – | 2.0 | V |
| | | | 5.5 | – | – | 2.0 | V |
| V _{T-} | negative-going threshold | see Figs 6 and 7 | 4.5 | 0.5 | – | – | V |
| | | | 5.5 | 0.6 | – | – | V |
| V _H | hysteresis (V _{T+} – V _{T-}) | see Figs 6 and 7 | 4.5 | 0.4 | – | 1.4 | V |
| | | | 5.5 | 0.4 | – | 1.6 | V |
| T_{amb} = –40 °C to +85 °C | | | | | | | |
| V _{T+} | positive-going threshold | see Figs 6 and 7 | 4.5 | – | – | 2.0 | V |
| | | | 5.5 | – | – | 2.0 | V |
| V _{T-} | negative-going threshold | see Figs 6 and 7 | 4.5 | 0.5 | – | – | V |
| | | | 5.5 | 0.6 | – | – | V |
| V _H | hysteresis (V _{T+} – V _{T-}) | see Figs 6 and 7 | 4.5 | 0.4 | – | 1.4 | V |
| | | | 5.5 | 0.4 | – | 1.6 | V |
| T_{amb} = –40 °C to +125 °C | | | | | | | |
| V _{T+} | positive-going threshold | see Figs 6 and 7 | 4.5 | – | – | 2.0 | V |
| | | | 5.5 | – | – | 2.0 | V |
| V _{T-} | negative-going threshold | see Figs 6 and 7 | 4.5 | 0.5 | – | – | V |
| | | | 5.5 | 0.6 | – | – | V |
| V _H | hysteresis (V _{T+} – V _{T-}) | see Figs 6 and 7 | 4.5 | 0.35 | – | 1.4 | V |
| | | | 5.5 | 0.35 | – | 1.6 | V |

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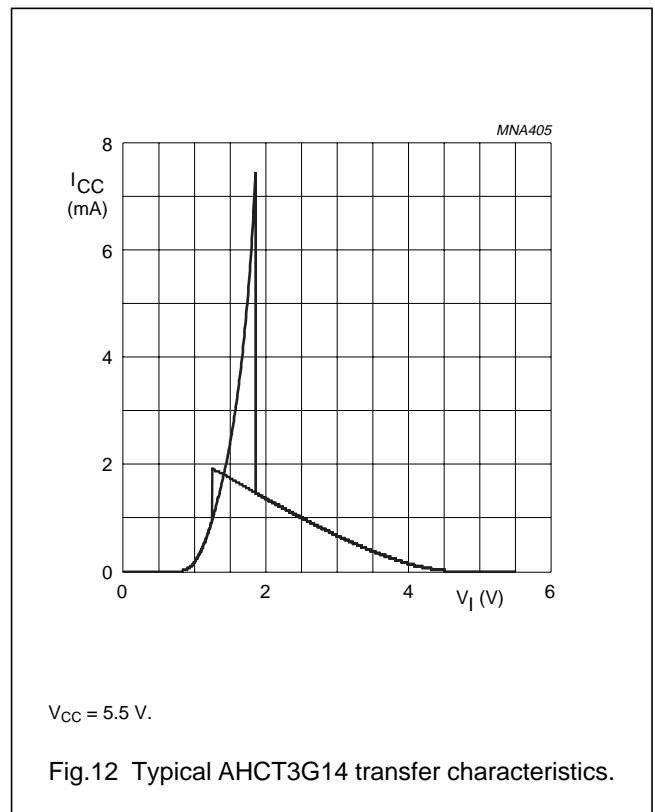
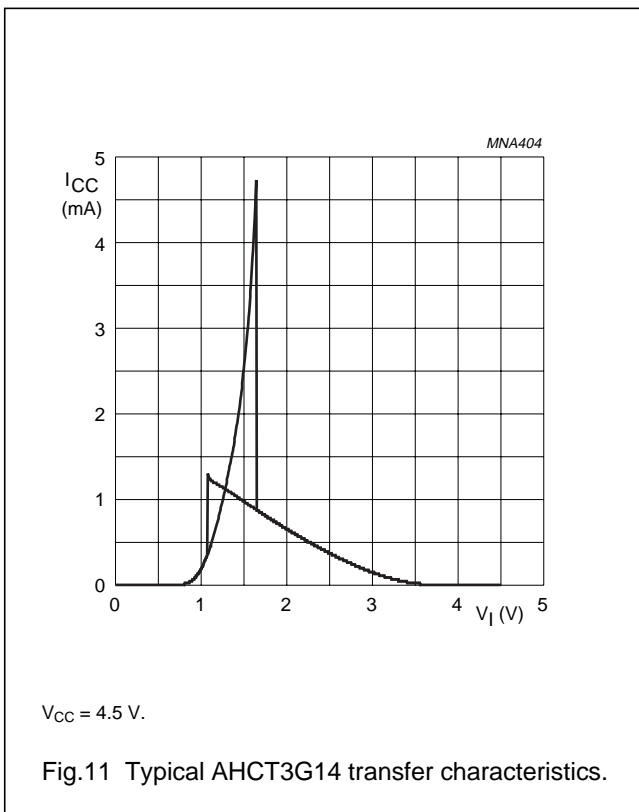
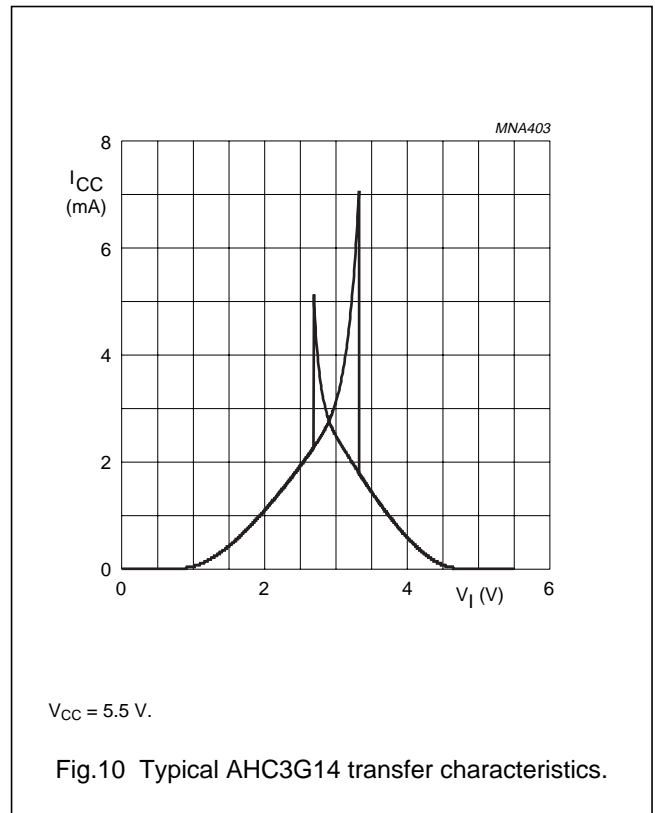
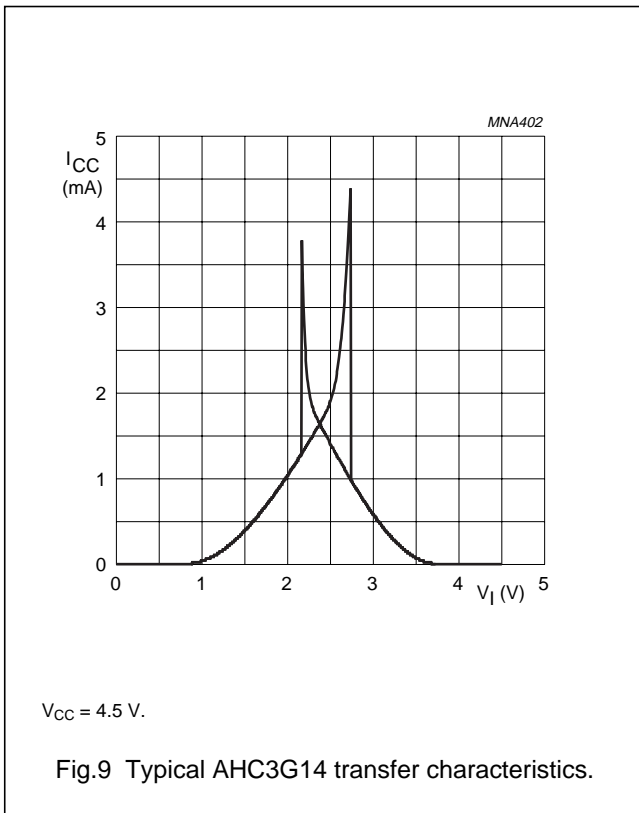
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TRANSFER CHARACTERISTIC WAVEFORMS



Inverting Schmitt trigger

74AHC3G14; 74AHCT3G14



Inverting Schmitt trigger

74AHC3G14; 74AHCT3G14

AC CHARACTERISTICS

Type 74AHC3G14

GND = 0 V; $t_r = t_f \leq 3.0$ ns.

| SYMBOL | PARAMETER | TEST CONDITIONS | | | MIN. | TYP. | MAX. | UNIT |
|--|----------------------------|--------------------|---------------------|---------------------|------|------|------|------|
| | | WAVEFORMS | V _{CC} (V) | C _L (pF) | | | | |
| T_{amb} = 25 °C | | | | | | | | |
| t _{PHL} /t _{PLH} | propagation delay nA to nY | see Figs 13 and 14 | 3.3 | 15 | – | 4.2 | – | ns |
| | | | | 50 | – | 6.0 | – | ns |
| | | | 3.0 to 3.6 | 15 | – | – | 12.8 | ns |
| | | | | 50 | – | – | 16.3 | ns |
| | | | 5.0 | 15 | – | 3.2 | – | ns |
| | | | | 50 | – | 4.6 | – | ns |
| | | | 4.5 to 5.5 | 15 | – | – | 8.6 | ns |
| | | | | 50 | – | – | 10.6 | ns |
| T_{amb} = –40 °C to +85 °C | | | | | | | | |
| t _{PHL} /t _{PLH} | propagation delay nA to nY | see Figs 13 and 14 | 3.0 to 3.6 | 15 | 1.0 | – | 15.0 | ns |
| | | | | 50 | 1.0 | – | 18.5 | ns |
| | | | 4.5 to 5.5 | 15 | 1.0 | – | 10.0 | ns |
| | | | | 50 | 1.0 | – | 12.0 | ns |
| T_{amb} = –40 °C to +125 °C | | | | | | | | |
| t _{PHL} /t _{PLH} | propagation delay nA to nY | see Figs 13 and 14 | 3.0 to 3.6 | 15 | 1.0 | – | 16.5 | ns |
| | | | | 50 | 1.0 | – | 20.5 | ns |
| | | | 4.5 to 5.5 | 15 | 1.0 | – | 11.0 | ns |
| | | | | 50 | 1.0 | – | 13.5 | ns |

Inverting Schmitt trigger

74AHC3G14; 74AHCT3G14

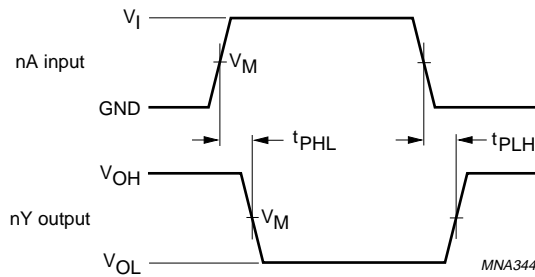
Type 74AHCT3G14GND = 0 V; $t_r = t_f \leq 3.0$ ns.

| SYMBOL | PARAMETER | TEST CONDITIONS | | | MIN. | TYP. | MAX. | UNIT |
|--|----------------------------|--------------------|---------------------|---------------------|------|------|------|------|
| | | WAVEFORMS | V _{CC} (V) | C _L (pF) | | | | |
| T_{amb} = 25 °C | | | | | | | | |
| t _{PHL} /t _{PLH} | propagation delay nA to nY | see Figs 13 and 14 | 5 | 15 | – | 4.1 | – | ns |
| | | | | 50 | – | 5.9 | – | ns |
| | | | 4.5 to 5.5 | 15 | – | – | 7.0 | ns |
| | | | | 50 | – | – | 8.5 | ns |
| T_{amb} = –40 °C to +85 °C | | | | | | | | |
| t _{PHL} /t _{PLH} | propagation delay nA to nY | see Figs 13 and 14 | 4.5 to 5.5 | 15 | 1.0 | – | 8.0 | ns |
| | | | | 50 | 1.0 | – | 10.0 | ns |
| T_{amb} = –40 °C to +125 °C | | | | | | | | |
| t _{PHL} /t _{PLH} | propagation delay nA to nY | see Figs 13 and 14 | 4.5 to 5.5 | 15 | 1.0 | – | 9.0 | ns |
| | | | | 50 | 1.0 | – | 11.0 | ns |

Inverting Schmitt trigger

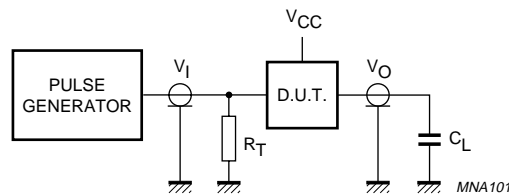
74AHC3G14; 74AHCT3G14

AC WAVEFORMS



| FAMILY | V _I INPUT REQUIREMENTS | V _M INPUT | V _M OUTPUT |
|--------|-----------------------------------|----------------------|-----------------------|
| AHC3G | GND to V _{CC} | 50 % V _{CC} | 50 % V _{CC} |
| AHCT3G | GND to 3.0 V | 1.5 V | 50 % V _{CC} |

Fig.13 The input (nA) to output (nY) propagation delays.



Definitions for test circuit:

C_L = Load capacitance including jig and probe capacitance. (See Chapter "AC characteristics" for values).

R_T = Termination resistance should be equal to the output impedance Z_o of the pulse generator.

Fig.14 Load circuitry for switching times.

Inverting Schmitt trigger

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APPLICATION INFORMATION

The slow input rise and fall times cause additional power dissipation. This can be calculated using the following formula:

$$P_{ad} = f_i \times (t_r \times I_{CC(AV)} + t_f \times I_{CC(AV)}) \times V_{CC}$$

Where:

P_{ad} = additional power dissipation (μW);

f_i = input frequency (MHz);

t_r = input rise time (ns); 10 % to 90 %;

t_f = input fall time (ns); 90 % to 10 %;

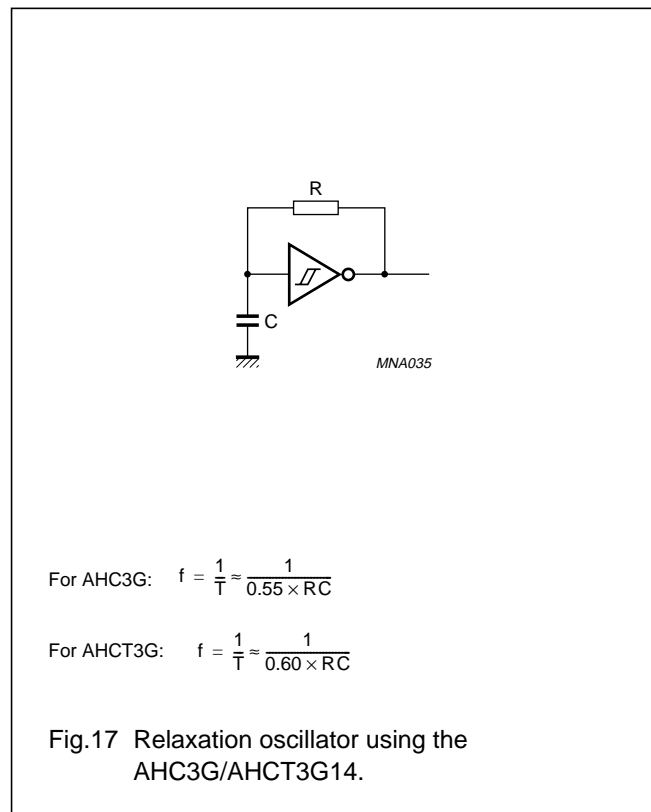
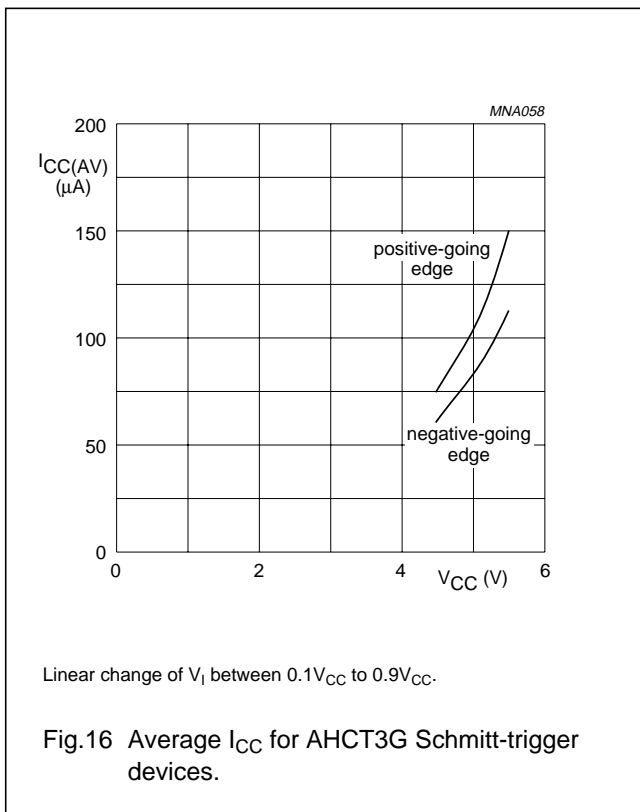
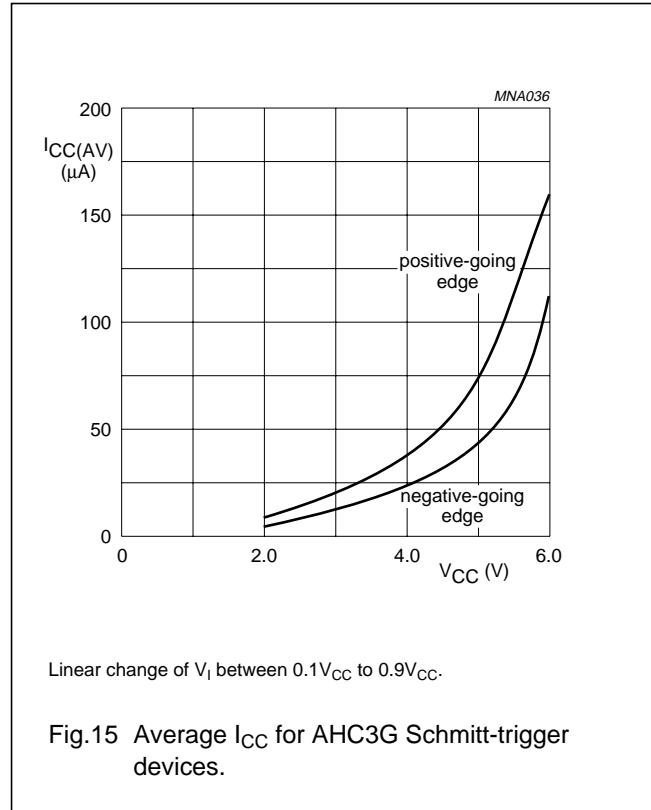
$I_{CC(AV)}$ = average additional supply current (μA).

Average I_{CC} differs with positive or negative input transitions, as shown in Figs 15 and 16.

For AHC3G/AHCT3G14 used in relaxation oscillator circuit, see Fig.17.

Remark to the application information

All values given are typical unless otherwise specified.

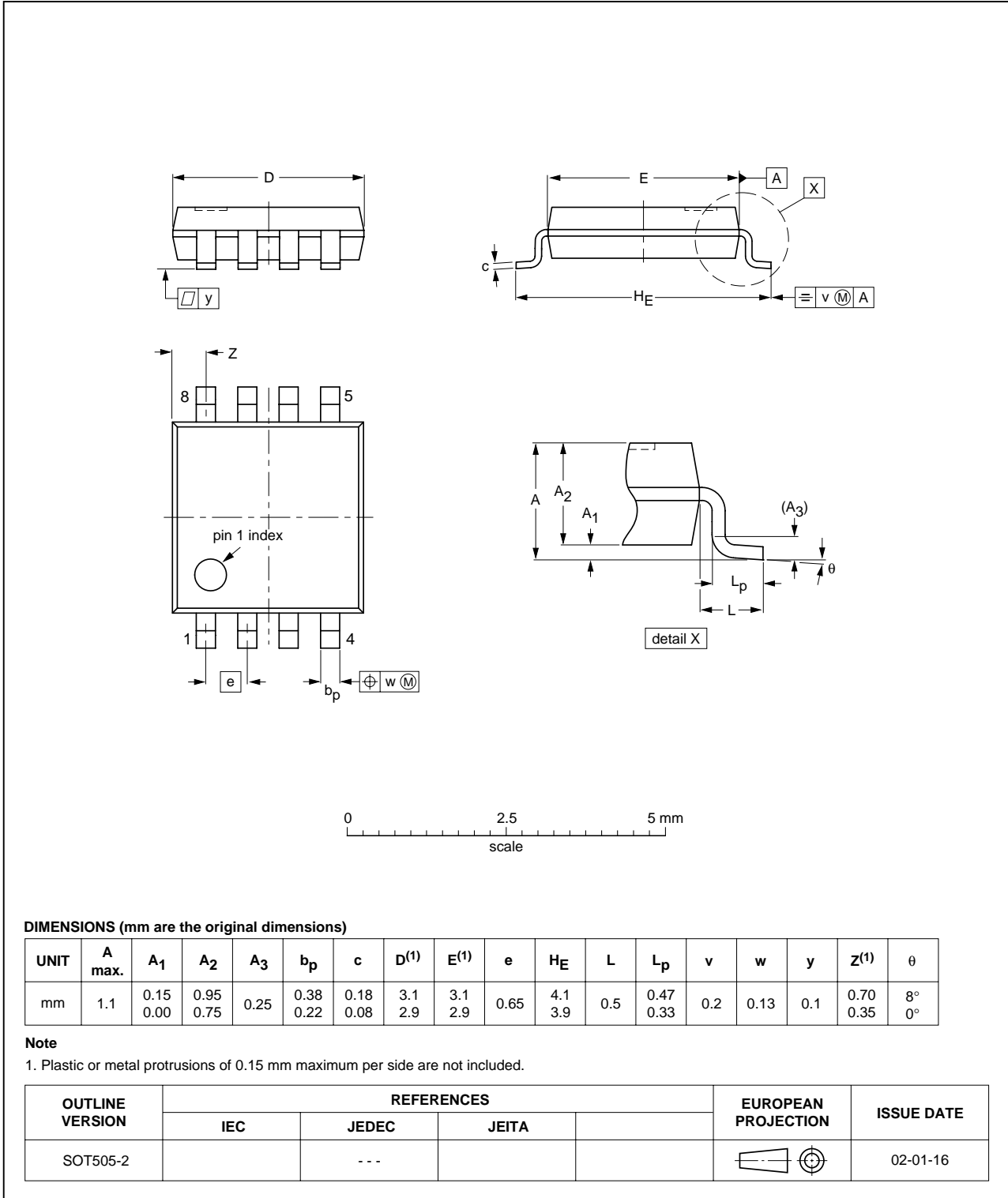


Inverting Schmitt trigger

74AHC3G14; 74AHCT3G14

PACKAGE OUTLINES

TSSOP8: plastic thin shrink small outline package; 8 leads; body width 3 mm; lead length 0.5 mm SOT505-2

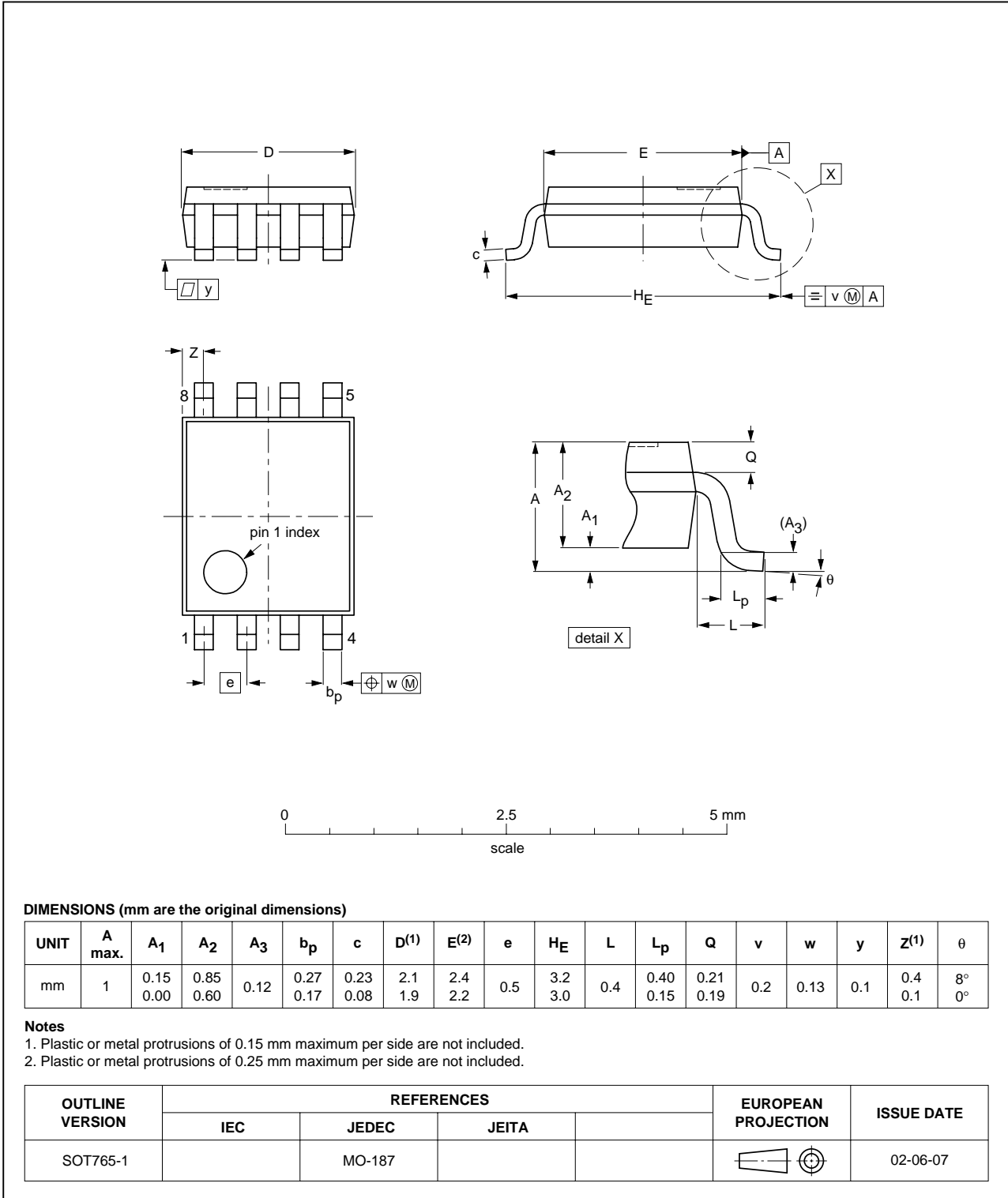


Inverting Schmitt trigger

74AHC3G14; 74AHCT3G14

VSSOP8: plastic very thin shrink small outline package; 8 leads; body width 2.3 mm

SOT765-1

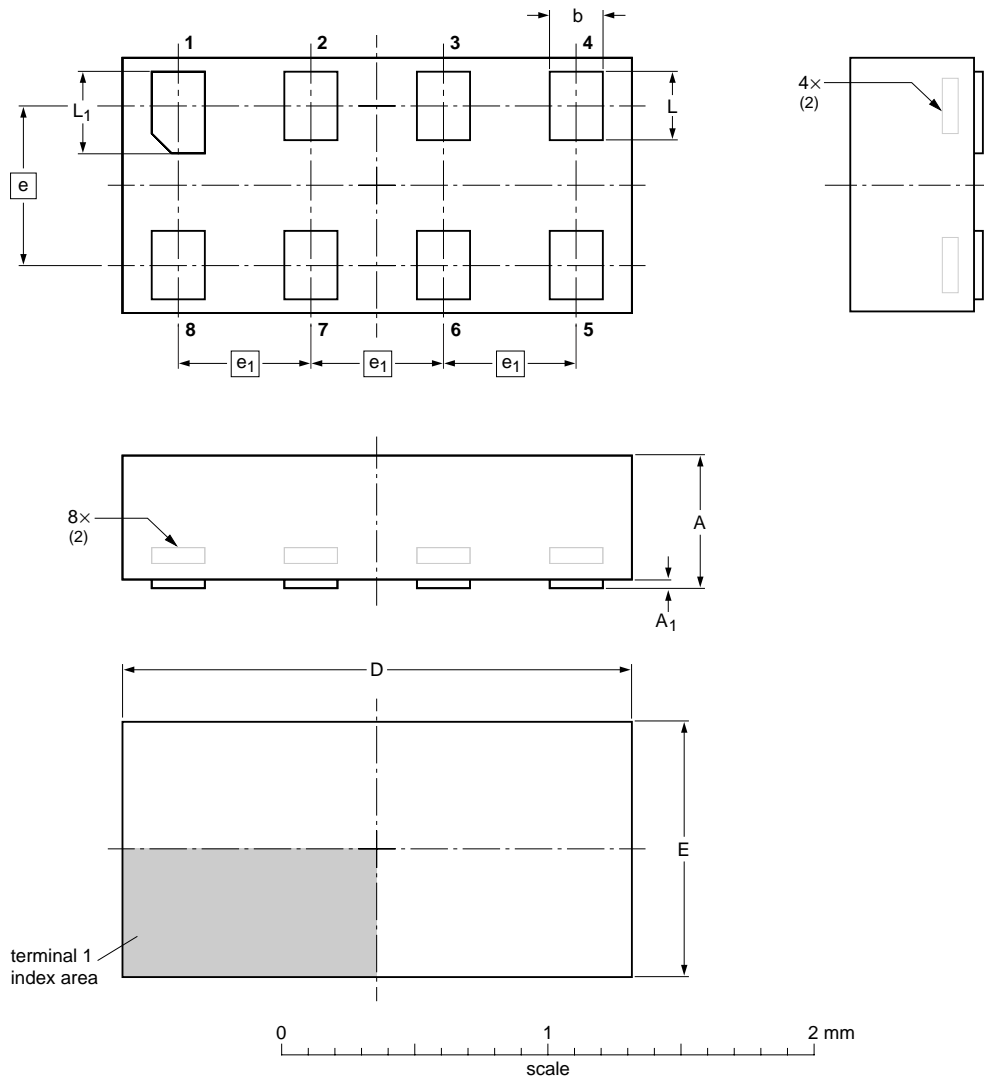


Inverting Schmitt trigger

74AHC3G14; 74AHCT3G14

XSON8: plastic extremely thin small outline package; no leads; 8 terminals; body 0.95 x 1.95 x 0.5 mm

SOT833-1



DIMENSIONS (mm are the original dimensions)

| UNIT | A ⁽¹⁾ max | A ₁ max | b | D | E | e | e ₁ | L | L ₁ |
|------|-------------------------|-----------------------|--------------|------------|------------|-----|----------------|--------------|----------------|
| mm | 0.5 | 0.04 | 0.25 0.17 | 2.0 1.9 | 1.0 0.9 | 0.6 | 0.5 | 0.35 0.27 | 0.40 0.32 |

Notes

1. Including plating thickness.
2. Can be visible in some manufacturing processes.

| OUTLINE VERSION | REFERENCES | | | EUROPEAN PROJECTION | ISSUE DATE |
|-----------------|------------|--------|-------|---------------------|----------------------|
| | IEC | JEDEC | JEITA | | |
| SOT833-1 | --- | MO-252 | --- | | 04-07-15 04-07-22 |

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74AHC3G14; 74AHCT3G14

DATA SHEET STATUS

| LEVEL | DATA SHEET STATUS ⁽¹⁾ | PRODUCT STATUS ⁽²⁾⁽³⁾ | DEFINITION |
|-------|----------------------------------|----------------------------------|--|
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