## GENERAL DESCRIPTION

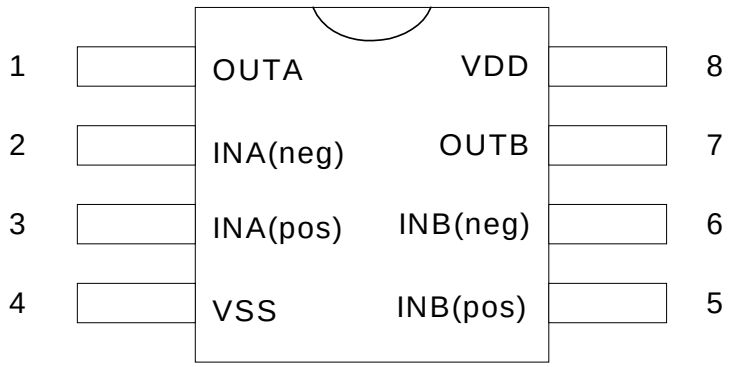
The CM8608 is an integrated class AB stereo headphone driver contained in an SO8 or a DIP8 plastic package. The device is fabricated in a 1 mm CMOS process and has been primarily developed for portable digital audio applications.

## FEATURES

- Wide temperature range
- No switch ON/OFF clicks
- Excellent power supply ripple rejection.
- Low power consumption
- Short-circuit resistant
- High performance
  - high signal-to-noise ratio
  - high slew rate
  - low distortion
- Large output voltage swing

## PIN CONFIGURATION

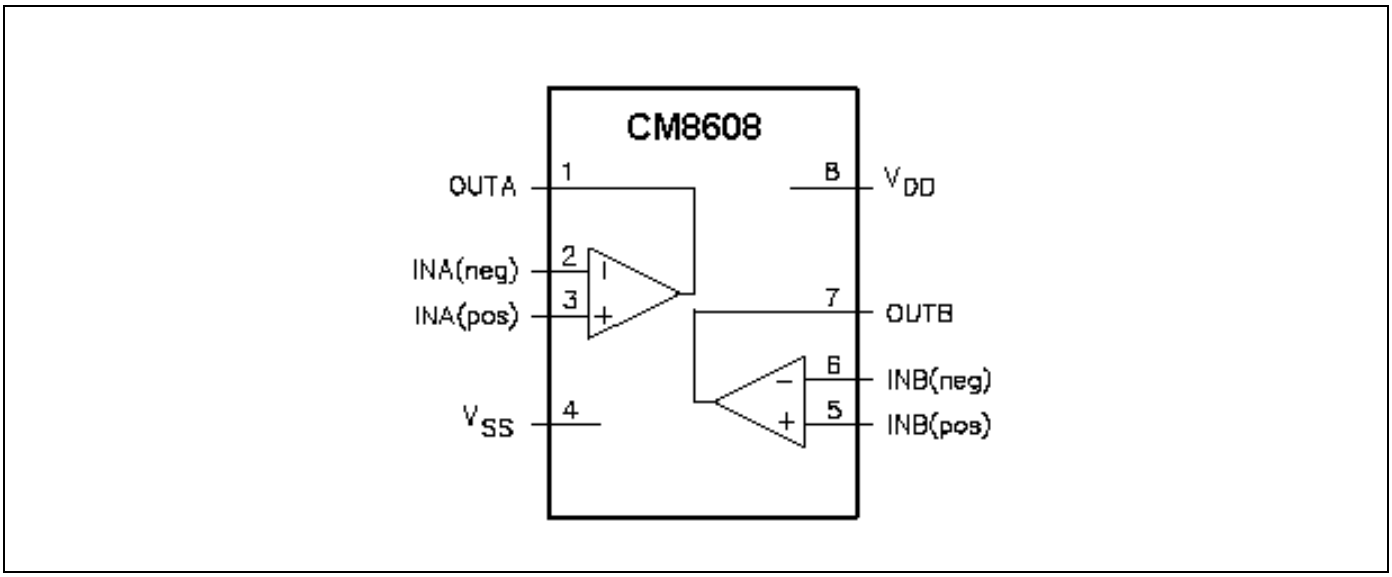
SOP-8 (S08)/PDIP (P08)
Top View




## PIN DESCRIPTION

| Pin No. | Symbol | Description |
|---|---|---|
| 1 | OUTA | Output A |
| 2 | INA(neg) | Inverting input A |
| 3 | INA(pos) | Non-inverting input A |
| 4 | VSS | Negative supply |
| 5 | INB(pos) | Non-inverting input B |
| 6 | INB(neg) | Inverting input B |
| 7 | OUTB | Output B |
| 8 | VDD | Positive supply |

## BLOCK DIAGRAM




## ORDERING INFORMATION

| Part Number | Temperature Range | Package |
|---|---|---|
| CM8608IP | -40℃ to 85℃ | 8-Pin PDIP (P08) |
| CM8608IS | -40℃ to 85℃ | 8-Pin SOP (S08) |

## ABSOLUTE MAXIMUM RATINGS

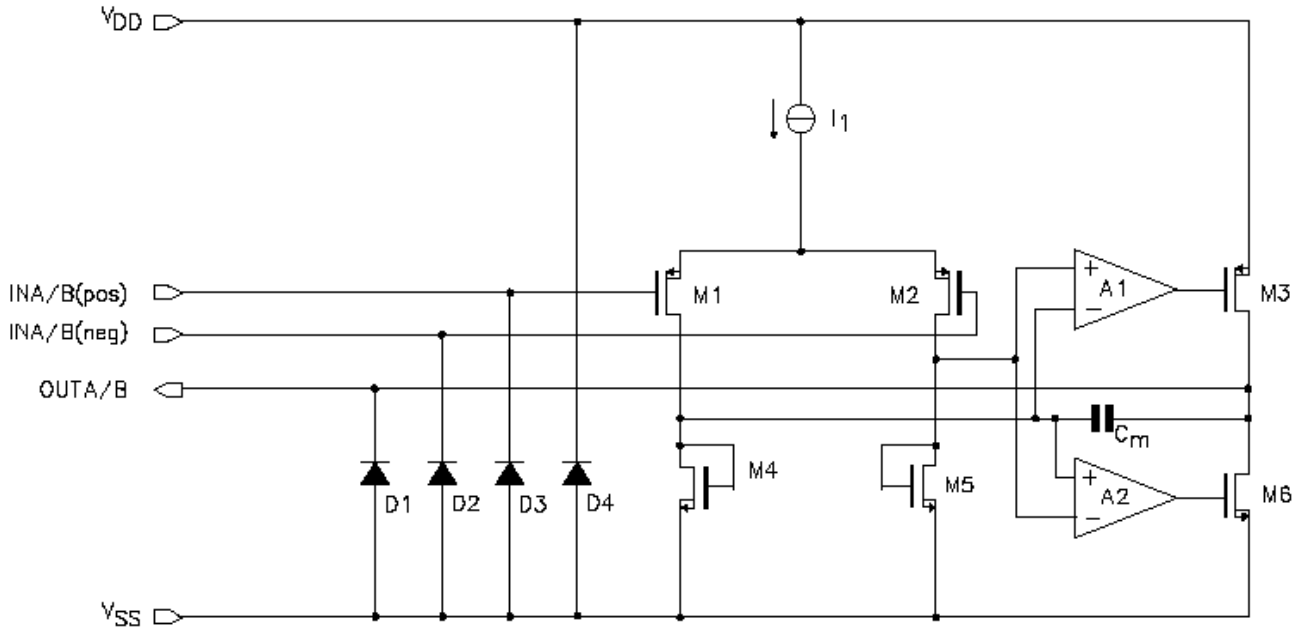
Absolute Maximum ratings are those values beyond which the device could be permanently damaged.

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|---|---|---|---|---|---|
| $V_{DD}$ | supply voltage | | 0 | 8.0 | V |
| $t_{SC(O)}$ | output short-circuit duration | $T_{amb}$ = 25 °C; $P_{tot}$ = 1 W | 20 | – | s |
| $T_{stg}$ | storage temperature | | –65 | +150 | °C |
| $T_{amb}$ | operating ambient temperature | | –40 | +85 | °C |
| $V_{esd}$ | electrostatic discharge | note 1 | –2000 | +2000 | V |
| | | note 2 | –200 | +200 | V |

## THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $R_{th\ j\text{-}a}$ | thermal resistance from junction to ambient in free air | | |
| | DIP8 | 109 | K/W |
| | SO8 | 210 | K/W |

## TYPICAL APPLICATION

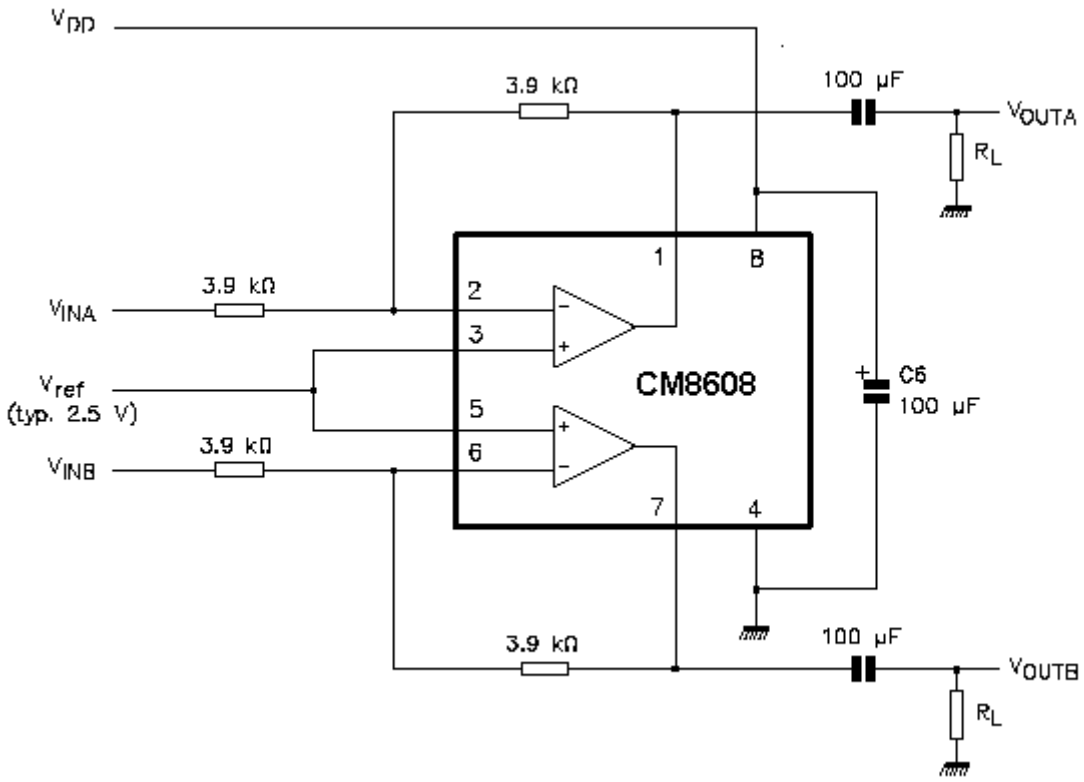


## ELECTRICAL CHARACTERISTICS **(Unless otherwise stated, these specifications apply $T_A$=25°C; VSS =0V, VDD=+5V, $f_j$ = 1kHZ, $R_L$ = 32Ω)** maximum ratings are stress ratings only and functional device operation is not implied.

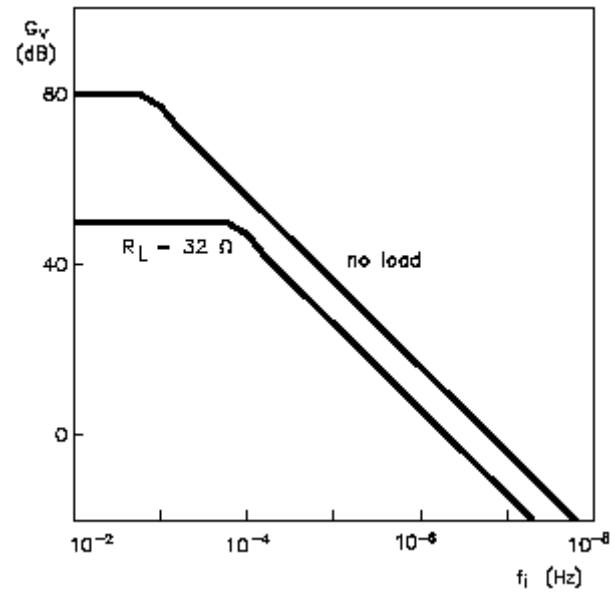
| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| **Supplies** | | | | | | |
| $V_{DD}$ | supply voltage | | | | | |
| | single | | 3.0 | 5.0 | 7.0 | V |
| | dual | | 1.5 | 2.5 | 3.5 | V |
| $V_{SS}$ | negative supply voltage | | –1.5 | –2.5 | –3.5 | V |
| $I_{DD}$ | supply current | no load | – | 3 | 5 | mA |
| $P_{tot}$ | total power dissipation | no load | – | 15 | 25 | mW |
| **DC characteristics** | | | | | | |
| $V_{I(os)}$ | input offset voltage | | – | 10 | – | mV |
| $I_{bias}$ | input bias current | | – | 10 | – | pA |
| $V_{CM}$ | common mode voltage | | 0 | – | 3.5 | V |
| $G_v$ | open-loop voltage gain | $R_L$ = 5 kΩ | – | 70 | – | dB |
| $I_O$ | maximum output current | (THD + N)/S < 0.1% | – | 60 | – | mA |
| $R_O$ | output resistance | | – | 0.25 | – | Ω |
| $V_O$ | output voltage swing | note 1 | 0.75 | – | 4.25 | V |
| | | $R_L$ = 16 Ω; note 1 | 1.5 | – | 3.5 | V |
| | | $R_L$ = 5 kΩ; note 1 | 0.1 | – | 4.9 | V |
| PSRR | power supply rejection ratio | $f_i$ = 100 Hz; $V_{ripple(p-p)}$ = 100 mV | – | 90 | – | dB |
| $\alpha_{cs}$ | channel separation | | – | 70 | – | dB |
| | | $R_L$ = 5 kΩ | – | 105 | – | dB |
| $C_L$ | load capacitance | | – | – | 200 | pF |
| **AC characteristics** | | | | | | |
| (THD + N)/S | total harmonic distortion plus noise-to-signal ratio | note 2 | – | –70 | –65 | dB |
| | | | – | 0.03 | 0.06 | % |
| | | note 2; $R_L$ = 5 kΩ | – | –101 | – | dB |
| | | | – | 0.0009 | – | % |
| S/N | signal-to-noise ratio | | 100 | 110 | – | dB |
| $f_G$ | unity gain frequency | open-loop; $R_L$ = 5 kΩ | – | 5.5 | – | MHz |
| $P_o$ | maximum output power | (THD + N)/S < 0.1% | – | 60 | – | mW |
| $C_i$ | input capacitance | | – | 3 | – | pF |
| SR | slew rate | unity gain inverting | – | 5 | – | V/µs |
| B | power bandwidth | unity gain inverting | – | 20 | – | kHz |

**Notes**
1. Values are proportional to $V_{DD}$ ; (THD + N)/S < 0.1%.
2. $V_{DD}$ = 5.0 V; $V_{O(p-p)}$ = 3.5 V (at 0 dB).

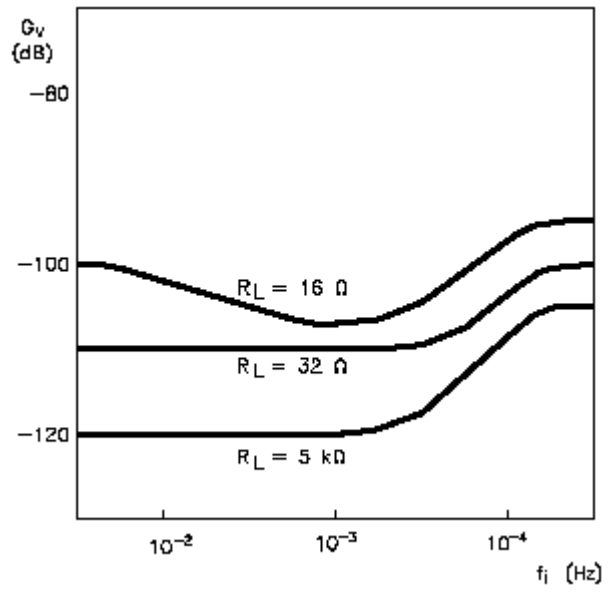
## TEST INFORMATION



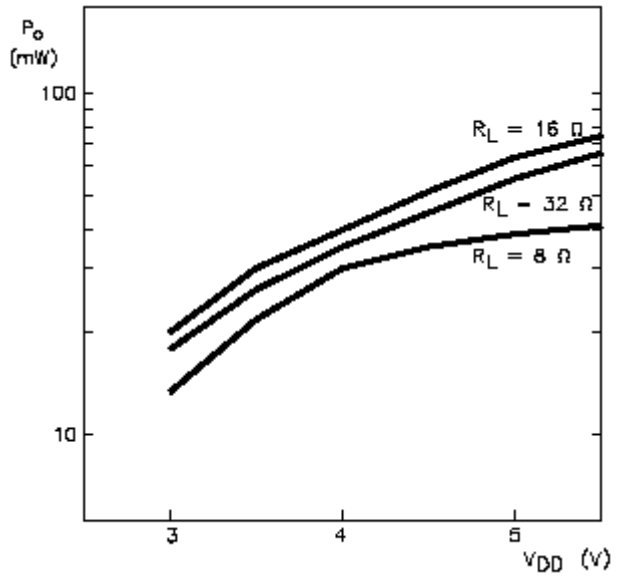

## TYPICAL CHARACTERISTICS



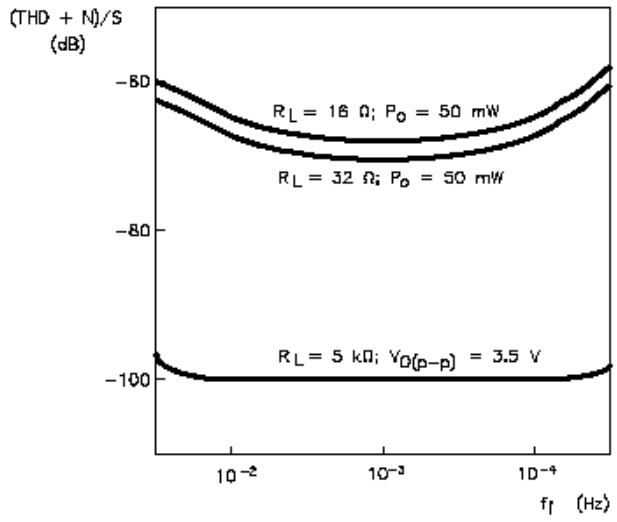

**Open-loop gain as a function of input frequency**



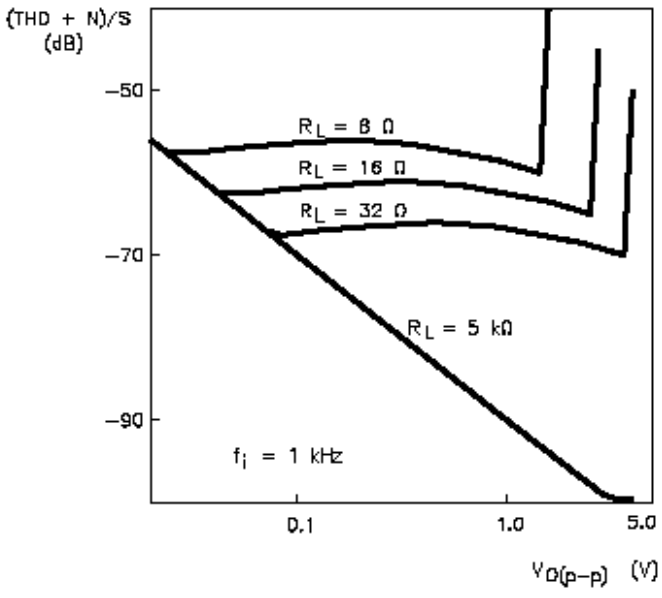

**Crosstalk as a function of input frequency**




**Output power as a function of supply voltage**



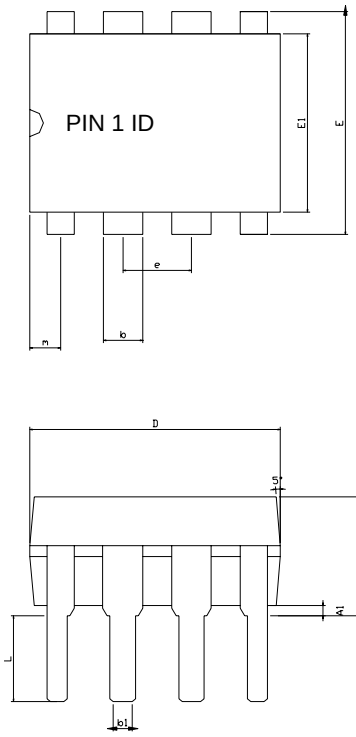

**THD plus noise-to-signal ratio as a function of input frequency**




**THD plus noise-to-signal ratio as a function of output voltage level**

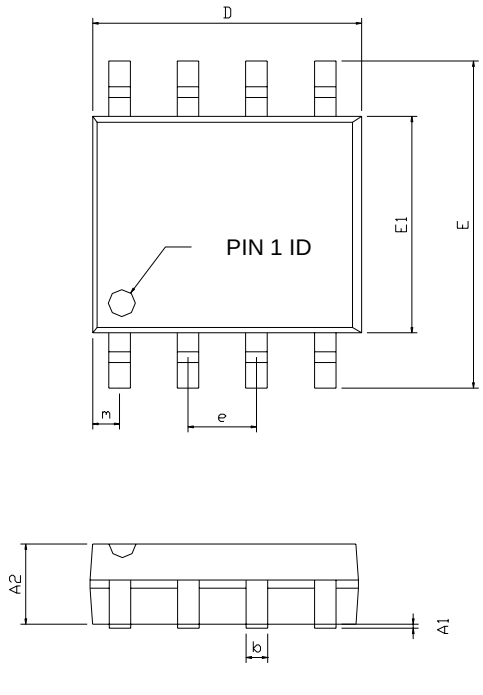
# PACKAGE DIMENSION

## 8-PIN PDIP (P08)




| SYMBOLS | DIMENSIONS IN MILLIMETERS | | | DIMENSIONS IN INCHS | | |
|---|---|---|---|---|---|---|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | --- | --- | 4.32 | --- | --- | 0.170 |
| A1 | 0.38 | --- | --- | 0.015 | --- | --- |
| b | 1.40 | --- | 1.65 | 0.055 | --- | 0.065 |
| b1 | 0.40 | --- | 0.56 | 0.016 | --- | 0.022 |
| C | 0.20 | --- | 0.31 | 0.008 | --- | 0.012 |
| D | 9.27 | --- | 9.77 | 0.365 | --- | 0.385 |
| E | 7.49 | --- | 8.26 | 0.295 | --- | 0.325 |
| E1 | 6.09 | --- | 6.61 | 0.240 | --- | 0.260 |
| e | --- | 2.54 | --- | --- | 0.100 | --- |
| L | 3.18 | --- | --- | 0.125 | --- | --- |
| m | 0.50 | --- | --- | 0.02 | --- | --- |
| θ | 0 | --- | 15 | 0 | --- | 15 |

## 8-PIN SOP (S08)




| SYMBOLS | DIMENSIONS IN MILLIMETERS | | | DIMENSIONS IN INCHS | | |
|---|---|---|---|---|---|---|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A1 | 0.10 | --- | 0.25 | 0.004 | --- | 0.010 |
| A2 | 1.40 | --- | 1.55 | 0.055 | --- | 0.061 |
| b | 0.30 | --- | 0.51 | 0.012 | --- | 0.020 |
| C | 0.15 | --- | 0.26 | 0.006 | --- | 0.010 |
| D | 4.60 | --- | 5.06 | 0.169 | --- | 0.199 |
| E | 5.79 | --- | 6.20 | 0.228 | --- | 0.244 |
| E1 | 3.76 | --- | 4.01 | 0.148 | --- | 0.158 |
| e | --- | 1.27 | --- | --- | 0.050 | --- |
| L | 0.38 | --- | 0.69 | 0.015 | --- | 0.035 |
| m | 0.43 | --- | 0.69 | 0.017 | --- | 0.027 |
| θ | 0° | --- | 8° | 0° | --- | 8° |

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