



TDA8219

PAL/NTSC DECODER AND VIDEO PROCESSOR

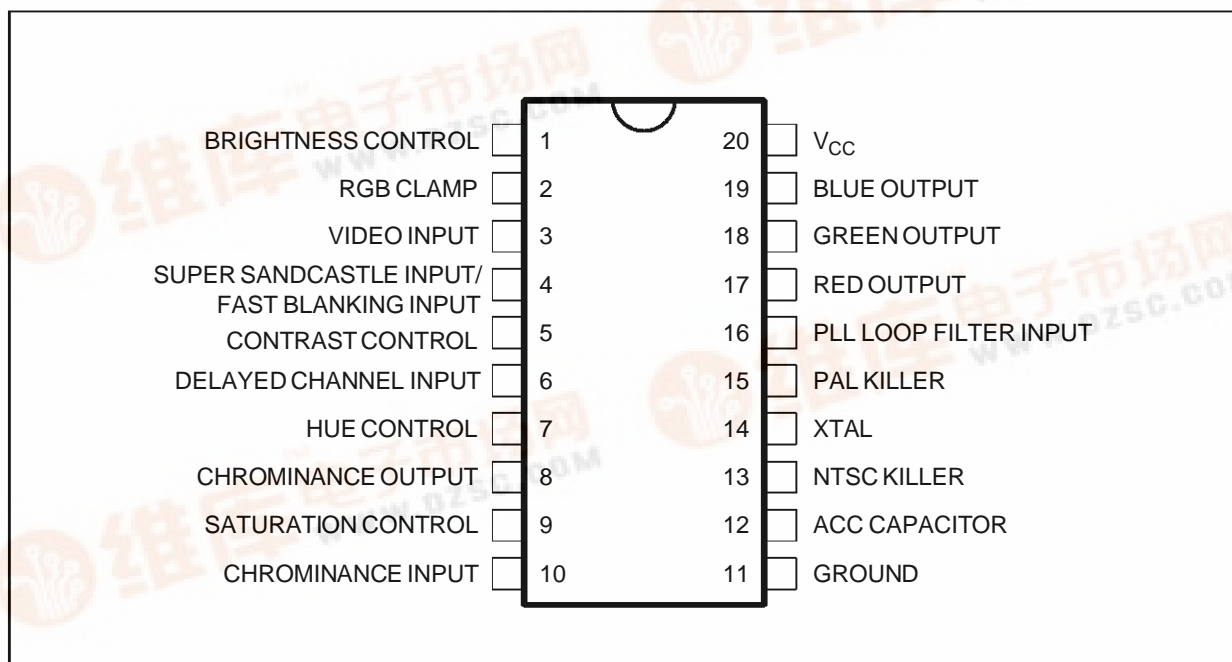
- RGB OUTPUTS
- SINGLE CHIP CHROMA AND LUMINANCE PROCESSOR
- DC CONTROL BRIGHTNESS, CONTRAST, SATURATION AND HUE
- FEW EXTERNAL COMPONENTS
- FAST BLANKING INPUT FOR OSD INSERTION
- SUPER SANDCASTLE INPUT

DESCRIPTION

The TDA8219 is a monolithic integrated color decoder for the PAL/NTSC standard. It includes in a 20 pins IC all the functions required for the identification and demodulation of PAL/NTSC signals, and all the videoprocessor functions up to the drive of the video stages. Used with TDA8213 (video & sound IF system) and TDA8214B (H/V deflection circuit), this IC permits a complete low-cost solution for PAL/NTSC applications.



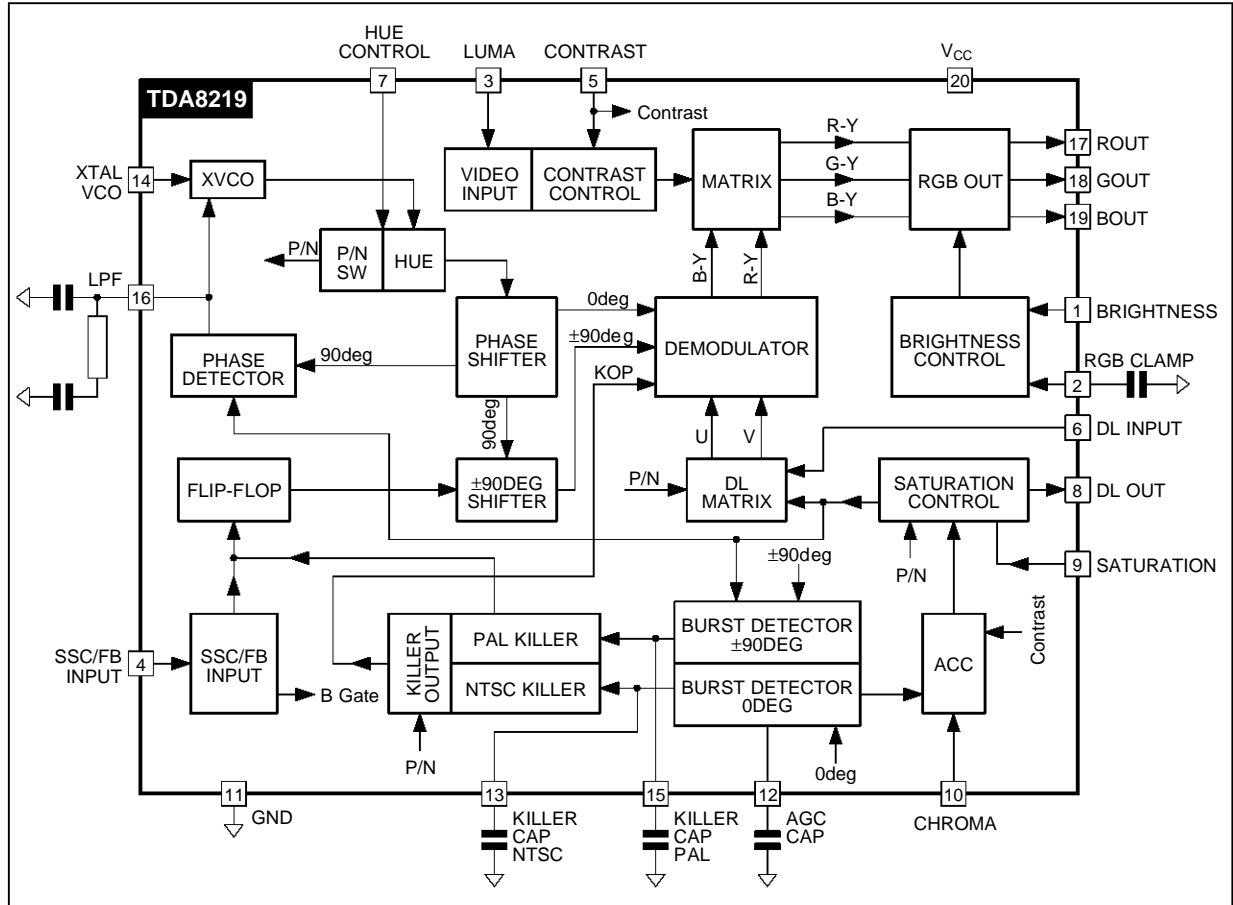
PIN CONNECTIONS



8219-01:EPS

TDA8219

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
|------------|-----------------------|-------------|------|
| V_{CC} | Supply voltage | 12 | V |
| T_{OPER} | Operating temperature | 0 , + 70 | °C |
| T_{STG} | Storage temperature | -55 , + 150 | °C |

THERMAL DATA

| Symbol | Parameter | Value | Unit |
|---------------|--|---------|------|
| $R_{TH(j-a)}$ | Junction to ambient thermal resistance | Max. 80 | °C/W |

DC AND AC ELECTRICAL CHARACTERISTICS

$V_{CC} = 9V$, $T_{AMB} = 25^{\circ}C$ (unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|----------|-------------------------|--------------------------|------|------|------|------|
| V_{CC} | Supply Voltage | | 8 | 9 | 10 | V |
| I_{CC} | Supply Current | No Load at $V_{CC} = 9V$ | 20 | 30 | 40 | mA |
| P_D | Total Power Dissipation | No Load | | 270 | 450 | mW |

LUMINANCE INPUT (Pin 3)

| Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|------------------------------|---------------------|------|-------|-------|------------------|
| Input Level (Black to White) | | | 350 | 500 | mV _{PP} |
| DC Operating Voltage | No Input Signal | 2.5 | 2.8 | 3.1 | V |
| Input Current | During Burst Period | ± 50 | ± 100 | ± 150 | μA |
| | Out of Burst Period | | | 5 | μA |

DC AND AC ELECTRICAL CHARACTERISTICS (continued)V_{CC} = 9V , T_{AMB} = 25°C (unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|--------|-----------|-----------------|------|------|------|------|
|--------|-----------|-----------------|------|------|------|------|

CHROMINANCE INPUT (Pin 10)

| | | | | | | |
|--|---|---|-----|-----|-----|------------------|
| | Input Level | | | 300 | 900 | mV _{PP} |
| | ACC Control Range | Change of Burst Signal over whole ACC Control Range < 1dB | | 30 | | dB |
| | Minimum Burst Signal Amplitude within the ACC Control Range | | | 30 | | mV _{PP} |
| | Input Impedance | | 6 | 8 | 12 | kΩ |
| | DC Operating Voltage | No Input Signal | 2.3 | 2.8 | 3.3 | V |

SSC INPUT (Pin 4)

| | | | | | | |
|--|--|--|-----|-----|-----|----|
| | Burst Gate Threshold | | 7.0 | 7.5 | 8.0 | V |
| | Line Blanking Threshold | | 3.1 | 3.6 | 3.9 | V |
| | Frame Blanking Threshold / Fast Blanking | | 0.5 | 1 | 1.5 | V |
| | Input Current | | | | 60 | μA |

CONTRAST CONTROL INPUT (Pin 5) (See Figure 1)

| | | | | | | |
|--|------------------------|--|----|--|----|----|
| | Input Current | | | | 10 | μA |
| | Contrast Control Range | | 20 | | | dB |

SATURATION CONTROL INPUT (Pin 9) (See Figure 2)

| | | | | | | |
|--|--|--|--|--|----|----|
| | Input Current | | | | 10 | μA |
| | Tracking between Luminance and Chrominance Signals over 10 dB Contrast Control | | | | 2 | dB |

BRIGHTNESS CONTROL INPUT (Pin 1) (See Figure 3)

| | | | | | | |
|--|---------------|--|--|--|----|----|
| | Input Current | | | | 10 | μA |
|--|---------------|--|--|--|----|----|

ACC CAPACITOR (Pin 12)

| | | | | | | |
|--|---------------------|--------------------------|--|-----|----|----|
| | Charging Current | During Burst Gate Period | | 200 | | μA |
| | Discharging Current | During Burst Gate Period | | | 10 | μA |
| | Leakage Current | Out of Burst Gate Period | | | 5 | μA |

PAL KILLER CAPACITOR (Pin 15)

| | | | | | | |
|--|-----------------------------------|------------------|--|-----|---|----|
| | Color off Voltage | No Chroma Signal | | 5.2 | | V |
| | Color on Voltage | | | 5.4 | | V |
| | PAL flip-flop inhibition level | | | 3.2 | | V |
| | Control Current | | | 200 | | μA |
| | Leakage Current | | | | 5 | μA |
| | Voltage with Nominal Input Signal | | | 6.0 | | V |

NTSC KILLER CAPACITOR (Pin 13)

| | | | | | | |
|--|-----------------------------------|------------------|--|-----|---|----|
| | Color off Voltage | No Chroma Signal | | 5.2 | | V |
| | Color on Voltage | | | 5.4 | | V |
| | Control Current | | | 200 | | μA |
| | Leakage Current | | | | 5 | μA |
| | Voltage with Nominal Input Signal | | | 6.0 | | V |

PLL LOOP FILTER (Pin 16)

| | | | | | | |
|--|-----------------|--|--|-----|---|----|
| | Control Current | | | 800 | | μA |
| | Leakage Current | | | | 5 | μA |

SUBCARRIER OUTPUT (Pin 8)

| | | | | | | |
|--|------------------------|--------------------------|-----|-----|-----|-----------------|
| | Output Burst Amplitude | Within ACC Control Range | 1.6 | 2.4 | 3.0 | V _{PP} |
|--|------------------------|--------------------------|-----|-----|-----|-----------------|

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DC AND AC ELECTRICAL CHARACTERISTICS (continued)

V_{CC} = 9V , T_{AMB} = 25°C (unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|--------|-----------|-----------------|------|------|------|------|
|--------|-----------|-----------------|------|------|------|------|

DELAYED CHANNEL INPUT (Pin 6)

| | | | | | | |
|--|----------------------|-----------------|-----|-----|-----|----|
| | DC Operating Voltage | No Input Signal | 2.0 | 2.2 | 2.4 | V |
| | Input impedance | | 6 | 8 | 12 | kΩ |

RGB OUTPUTS (Pins 17-18-19)

| | | | | | | |
|--|--|--|------|------|------|-----------------|
| | Output Signal Amplitude (Black to White) | 0.35V B to W, Signal @ Pin 3, Contrast @ 4.2V, Sat. @ 1.6V, Brig. @ 3.5V | 2.80 | 3.15 | 3.50 | V |
| | Blue Channel Output Amplitude (no Y) | 300mV _{PP} (B-Y), Signal with 200mV _{PP} Burst Amplitude at Pin 10, Contrast @ 4.2V, Sat. @ 4.2V, Brig. @ 3.5V | 3.5 | 3.9 | 4.3 | V _{PP} |
| | Individual Output Sinking Current | | 1.5 | 2 | 2.5 | mA |
| | Maximum Peak White Level | | 7.4 | 7.8 | 8.2 | V |
| | Blanking Level | | 1.0 | 1.2 | 1.4 | V |
| | Black Level Differential Error | | | | 350 | mV |
| | Relative Variation in Black Level with Various Saturation, Contrast and Brightness Control Level | | | | 10 | mV |
| | Black Level Thermal Drift | | | 0.5 | | mV/°C |
| | Differential Black Level Drift over 40°C Temperature Range | | | 5 | | mV |
| | Frequency Response(-3dB) | | | 7 | | MHz |

HUE CONTROL INPUT (Pin 7) (see Figure 4)

| | | | | | | |
|--|---------------------|--|------|------|-----|-----|
| | Control Range | | ± 20 | ± 45 | | deg |
| | Input Current | | | | 10 | μA |
| | NTSC Select Voltage | | 2.0 | | 6.0 | V |
| | PAL Select Voltage | | 00 | | 0.5 | V |

XTAL (Pin 14)

| | | | | | | |
|--|----------------|---|--|----------------|--|----------|
| | Catching Range | PAL, XTAL with CM = 13fF NTSC, XTAL with CM = 13fF | | ± 700 ± 700 | | Hz Hz |
|--|----------------|---|--|----------------|--|----------|

RGB CLAMP CAPACITOR (Pin 2)

| | | | | | | |
|--|-----------------|--|----|-----|-----|----|
| | Control Current | | 50 | 100 | 150 | μA |
| | Leakage Current | | | | 5 | μA |

Figure 1 : Contrast Control Voltage Range

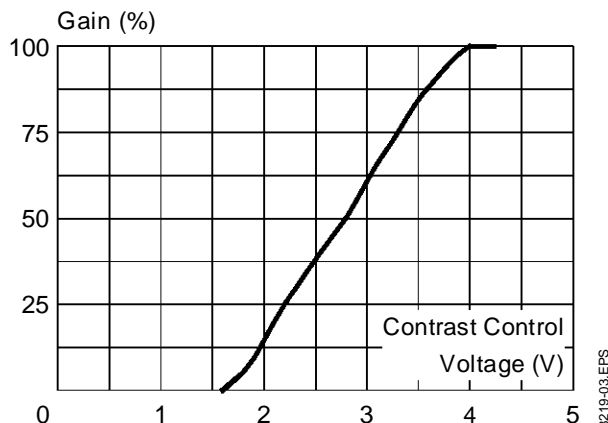


Figure 2 : Saturation Control Voltage Range

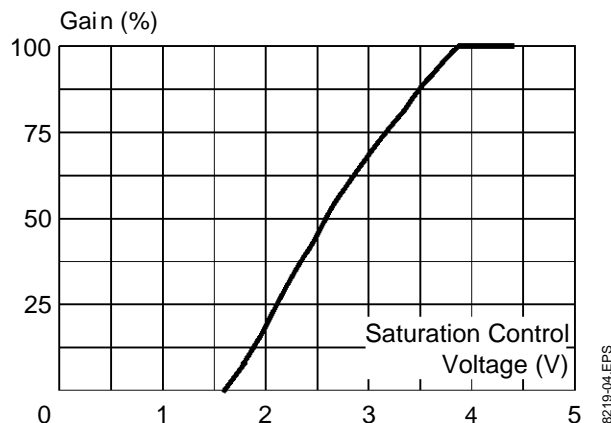
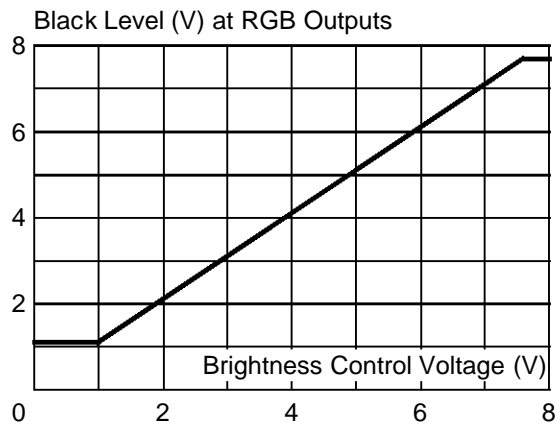
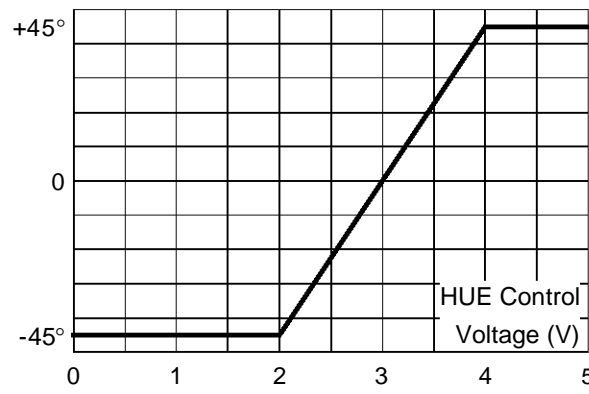


Figure 3 : Brightness Control Voltage Range



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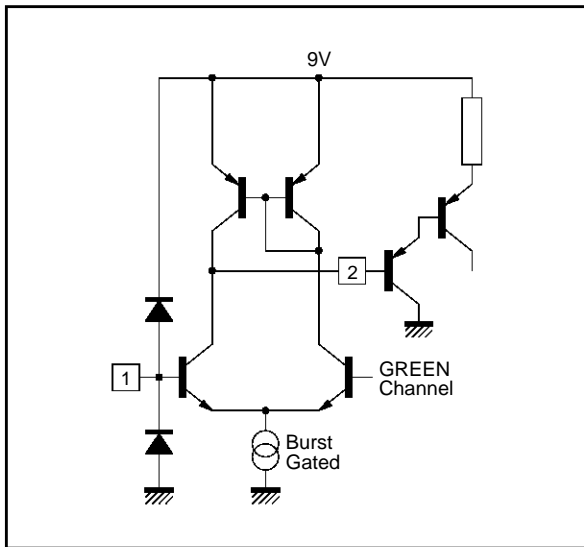
Figure 4 : Hue Control Voltage Range



8219-06.EPS

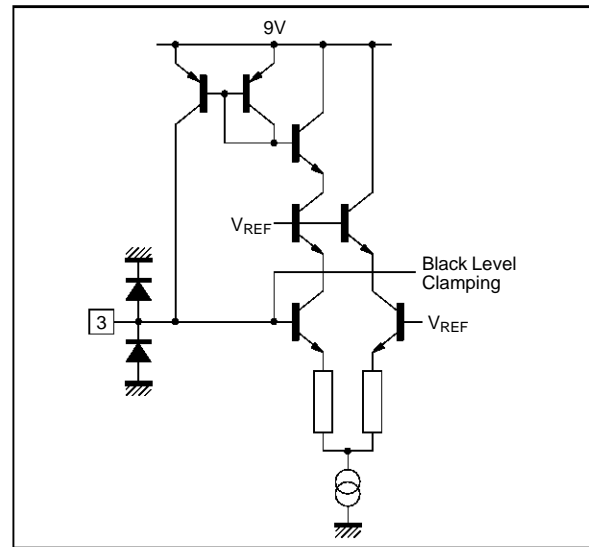
INPUT / OUTPUT PIN CONFIGURATION

Figure 5 : Pins 1 - 2 Configuration



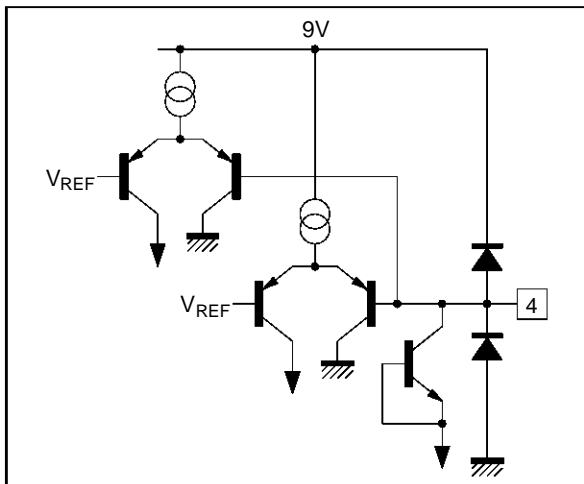
8219-07.EPS

Figure 6 : Pin 3 Configuration



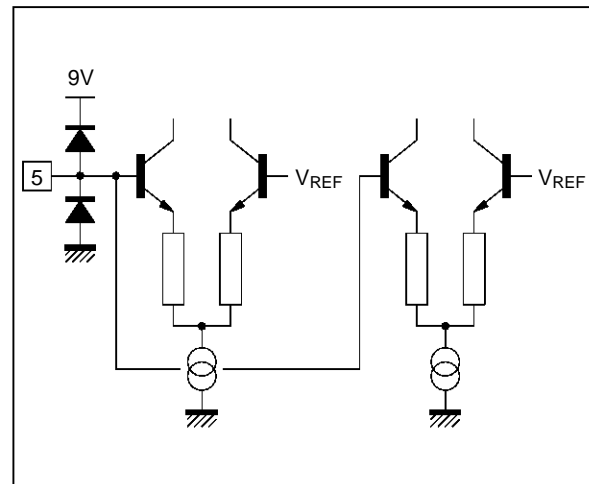
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Figure 7 : Pin 4 Configuration



8219-09.EPS

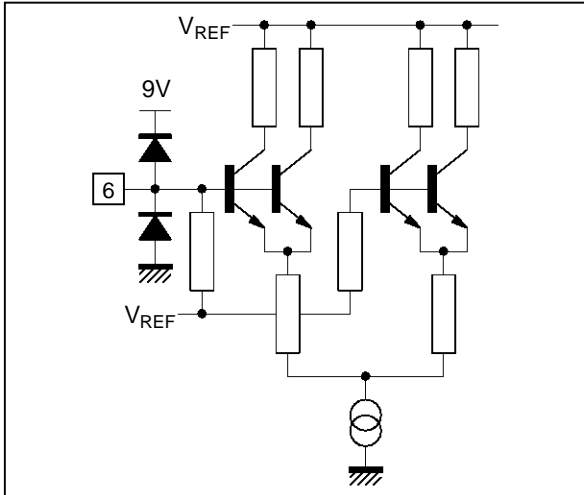
Figure 8 : Pin 5 Configuration



8219-10.EPS

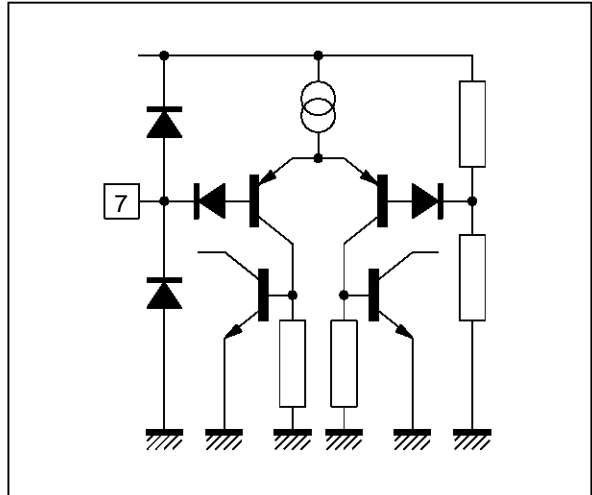
INPUT / OUTPUT PIN CONFIGURATION (continued)

Figure 9 : Pin 6 Configuration



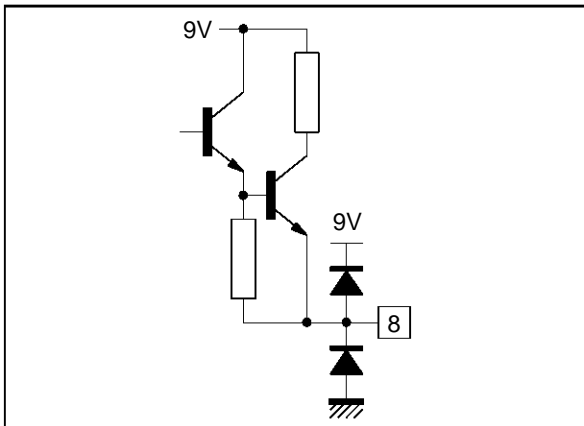
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Figure 10 : Pin 7 Configuration



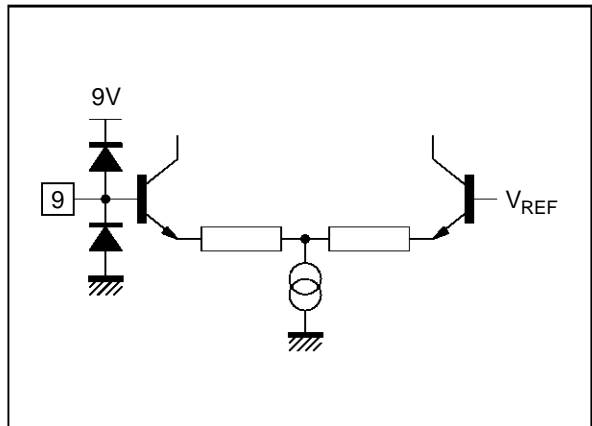
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Figure 11 : Pin 8 Configuration



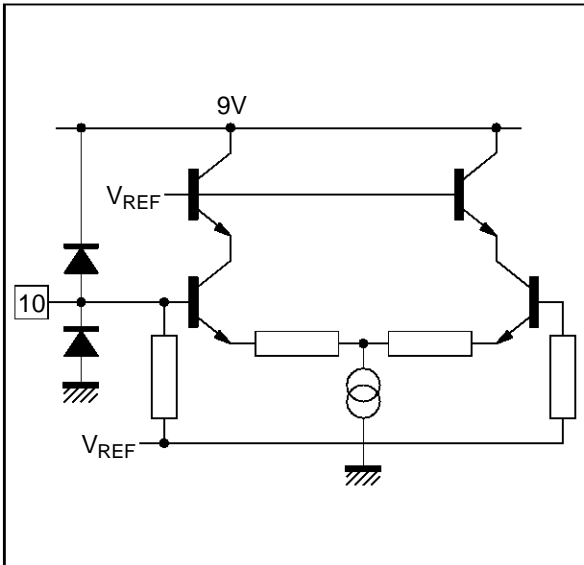
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Figure 12 : Pin 9 Configuration



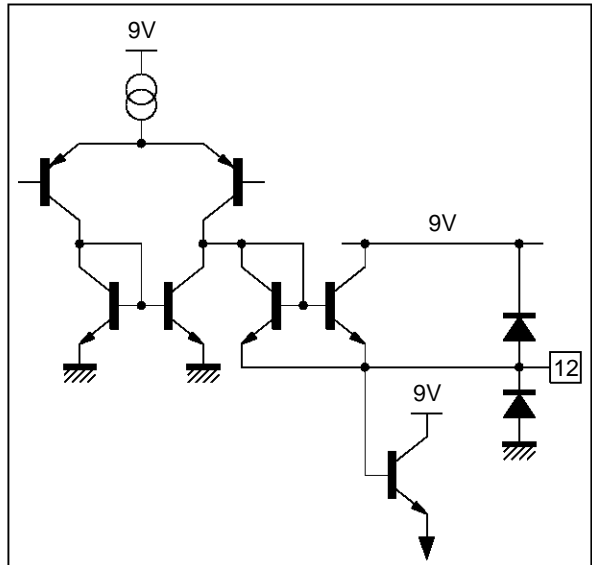
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Figure 13 : Pin 10 Configuration



8219-14.EPS

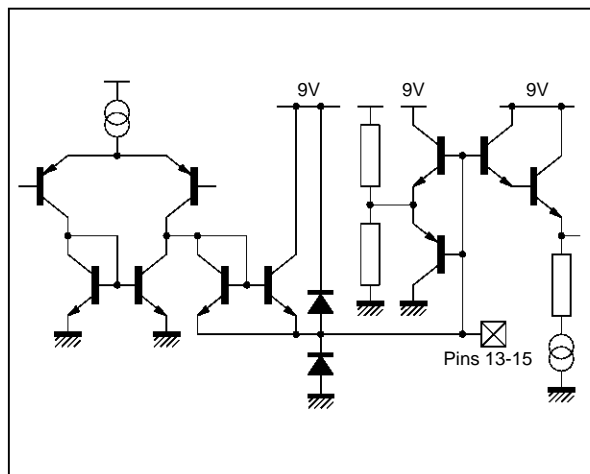
Figure 14 : Pin 12 Configuration



8219-15.EPS

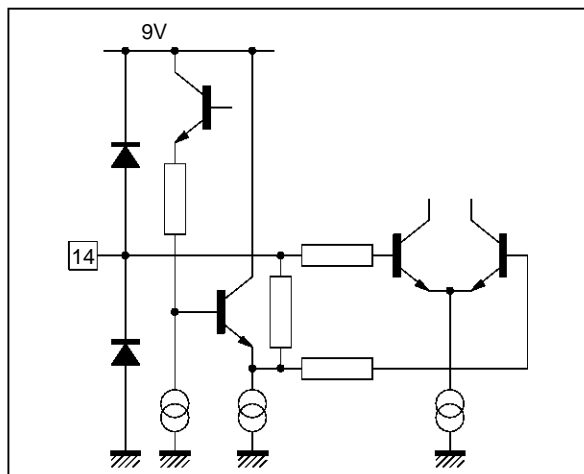
INPUT / OUTPUT PIN CONFIGURATION (continued)

Figure 15 : Pins 13 - 15 Configuration



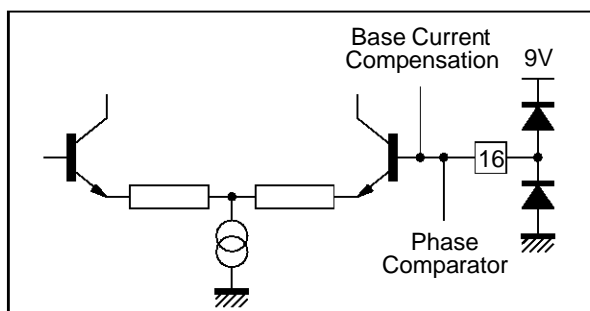
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Figure 16 : Pin 14 Configuration



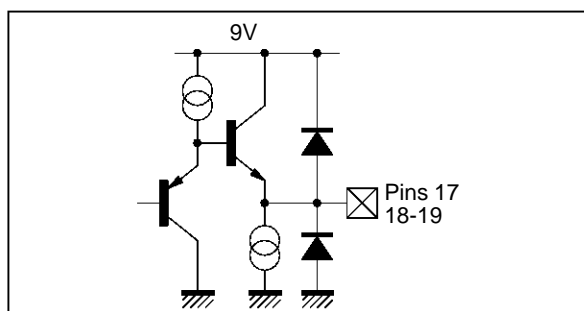
8219-17.EPS

Figure 17 : Pin 16 Configuration



8219-18.EPS

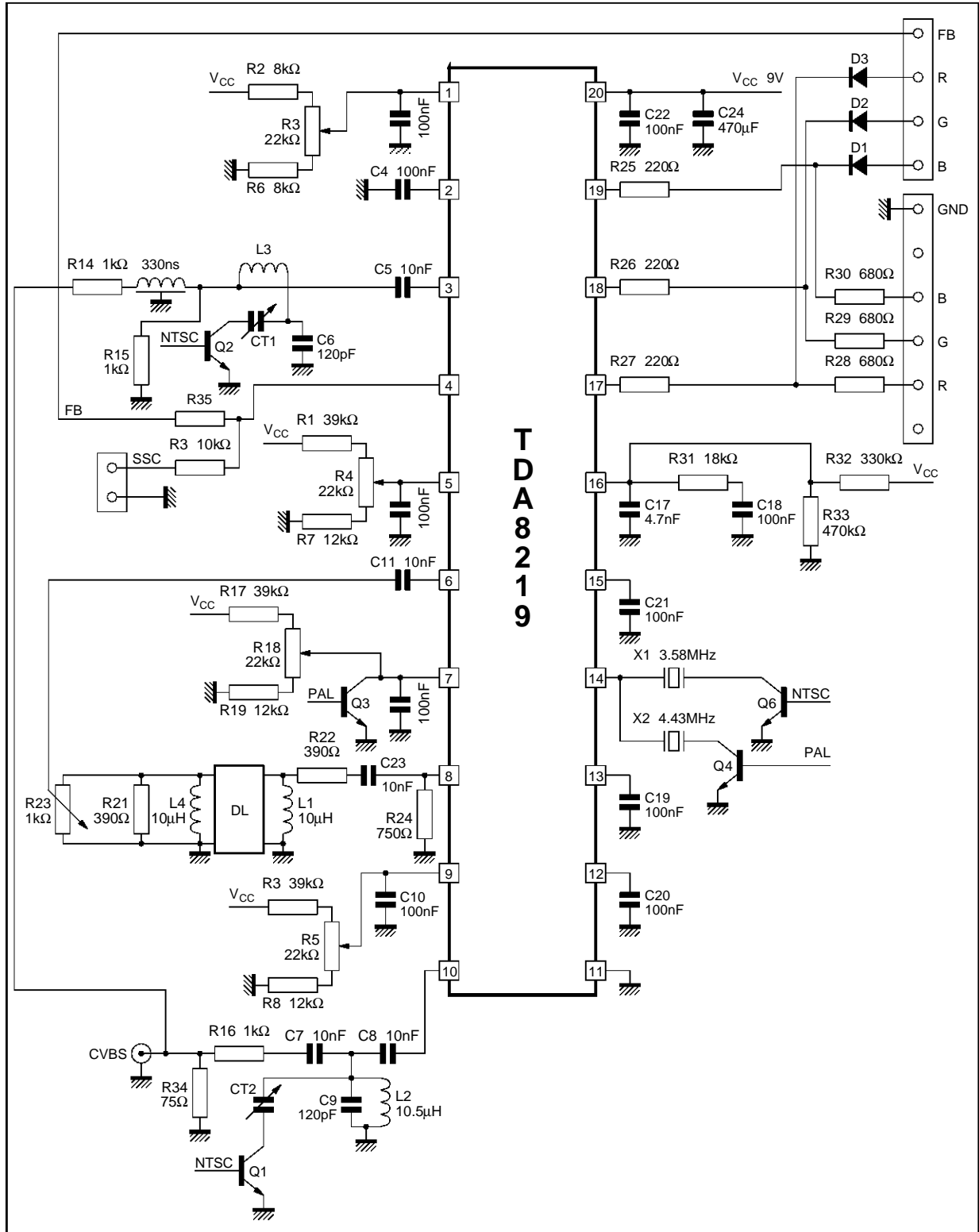
Figure 18 : Pins 17 - 18 - 19 Configuration



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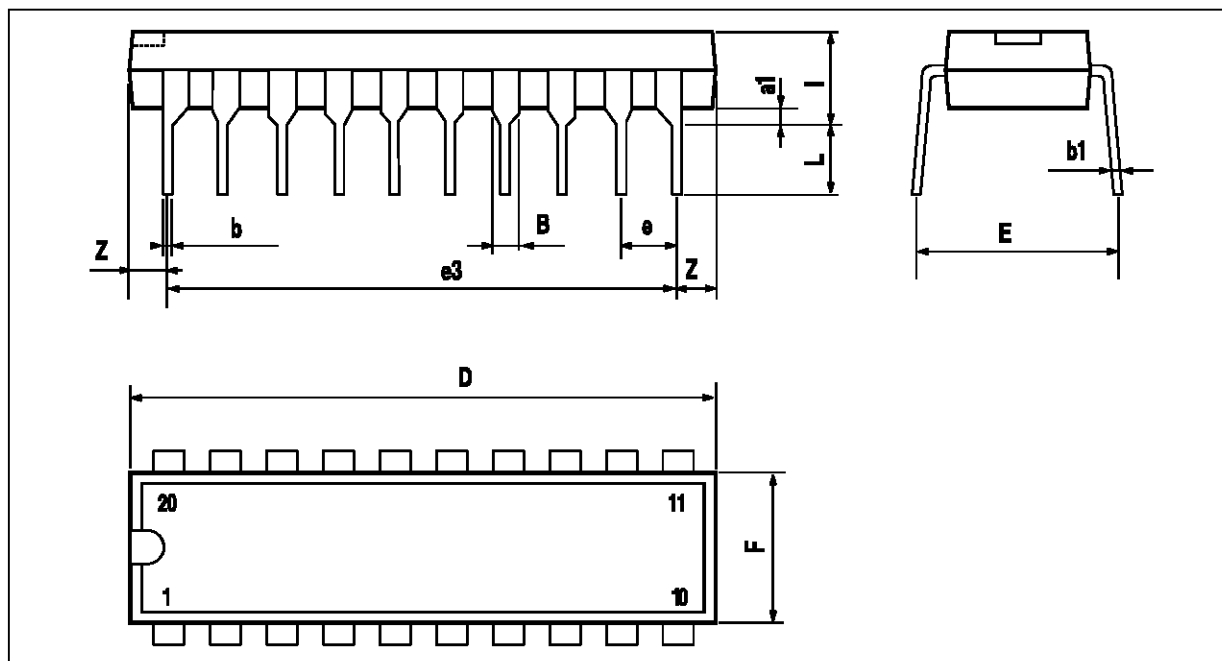
APPLICATION DIAGRAM (with OSD capability)



8219-20.EPS

PACKAGE MECHANICAL DATA

20 PINS - PLASTIC DIP



PW-DIP20.EPS

| Dimensions | Millimeters | | | Inches | | |
|------------|-------------|-------|------|--------|-------|-------|
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| a1 | 0.254 | | | 0.010 | | |
| B | 1.39 | | 1.65 | 0.055 | | 0.065 |
| b | | 0.45 | | | 0.018 | |
| b1 | | 0.25 | | | 0.010 | |
| D | | | 25.4 | | | 1.000 |
| E | | 8.5 | | | 0.335 | |
| e | | 2.54 | | | 0.100 | |
| e3 | | 22.86 | | | 0.900 | |
| F | | | 7.1 | | | 0.280 |
| l | | | 3.93 | | | 0.155 |
| L | | 3.3 | | | 0.130 | |
| Z | | | 1.34 | | | 0.053 |

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