

NEC

BLUDDK D3AG8P 1ANN CONFIGURATION (14)

DATA SHEET

MOS INTEGRATED CIRCUIT

μ PD4712C/4712D

RS-232 LINE DRIVER/RECEIVER

The μ PD4712C and 4712D are high-voltage silicon gate CMOS line driver/receiver conforming to the EIA/TIA-232-E standard. It can operate with a single +5 V power source because it is provided with a DC-DC converter. In addition, this line driver/receiver has many ancillary functions, including output control, threshold select, and standby functions. Because the μ PD4712C and 4712D are provided with four output driver circuits and four receiver circuits, it can constitute an RS-232 interface circuit with a single chip.

FEATURES

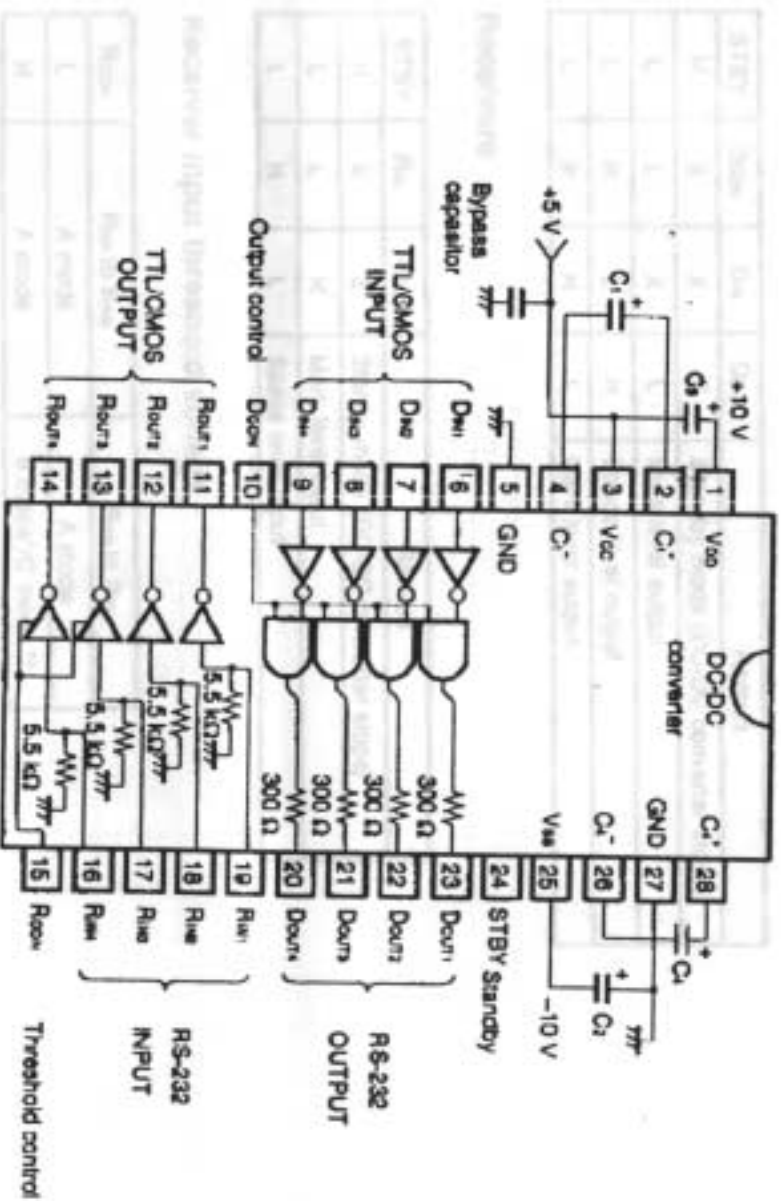
- Conforms to EIA/TIA-232-E (RS-232C) standard
- +5 V single power source
- Threshold select pin selecting two types of threshold voltages
- Standby mode can be set by making standby pin high to reduce circuit current.
- Three-state output configuration. Both driver and receiver outputs go into high-impedance state in standby mode.

ORDERING INFORMATION

| Part Number | Package |
|-----------------|------------------------------|
| μ PD4712CCY | 28-pin plastic DIP (400 mil) |
| μ PD4712DCY | 28-pin plastic DIP (400 mil) |
| μ PD4712CGT | 28-pin plastic SOP (375 mil) |
| μ PD4712DGT | 28-pin plastic SOP (375 mil) |

BLOCK DIAGRAM/PIN CONFIGURATION (Top View)

Drivers



- * V_{cc} and V_{ss} are output pins of voltages internally boosted. Connecting a load directly to these pins is not recommended.
- ** The standby pin is internally pulled down.
- *** Use capacitors with a working voltage of 16 V or higher as C₁ through C₄. Insert a bypass capacitor about 0.1 to 1 μF between V_{cc} pin to GND pin.

TRUTH TABLE

Drivers

| STBY | Di0M | Di1N | Do0r | Do1r | Remark |
|------|------|------|------|------|--------------------------------------|
| H | X | X | Z | | Standby mode (DC-DC converter stops) |
| L | L | X | L | | Mark level output |
| L | H | L | H | | Space level output |
| L | H | H | L | | Mark level output |

Receivers

| STBY | Ri0M | Ri0r | Remark |
|------|------|------|--------------------------------------|
| H | X | Z | Standby mode (DC-DC converter stops) |
| L | L | H | Mark level input |
| L | H | L | Space level input |

Receiver Input threshold voltage

| Ri0M | Ri0r to Ri1e | Ri1e to Ri0M | Unit |
|------|--------------|----------------------------|------|
| L | A mode | A mode | V |
| H | A mode | B mode/V _C mode | V |

μPPD4712C, μPPD4712D

H: high level, L: low level, Z: high impedance, X: H or L

MUTUAL CHARACTERISTICS (OVERALL)

Standard characteristics specified, V_{cc} = +5 V ±10 %, T_A = -20 °C to +80 °C, C₁ = 0.1 μF, C₂ = 22 μF

Symbol

Remark

Condition

Unit

Value

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

| Parameter | Symbol | Symbol | MIN. | TYP. | MAX. | Unit |
|-----------------------------|------------------|--------|------|------|------|------|
| Supply voltage | V _{CC} | | | | | V |
| Driver input voltage | D _{IN} | | | | | V |
| Receiver input voltage | R _{IN} | | | | | V |
| Driver output voltage | D _{OUT} | | | | | V |
| Receiver output voltage | R _{OUT} | | | | | V |
| Receiver input current | I _{IN} | | | | | mA |
| Operating temperature range | T _A | | | | | °C |
| Storage temperature range | T _{STG} | | | | | °C |
| Power dissipation | P _T | | | | | W |

Note 1. Pulse width: 1 ms, duty factor: 10 % MAX.

RECOMMENDED OPERATING RANGE

| Parameter | Symbol | MIN. | TYP. | MAX. | Unit |
|-----------------------------|-----------------|------|------|------|------|
| Supply voltage | V _{CC} | 4.5 | 5.0 | 5.5 | V |
| Receiver input voltage | R _{IN} | -30 | | +30 | V |
| Operating temperature range | T _A | -20 | | 80 | °C |
| External capacitance | Note 2 | 4.7 | | 47 | μF |

Note 2. The capacitance of an electrolytic capacitor decreases at a low temperature (0 °C or lower). Determine the capacitance of the capacitor to be used taking this into consideration when the μPD4712C and 4712D are used at a low temperature. Keep the wiring length between the capacitor and IC as short as possible.

ELECTRICAL CHARACTERISTICS (OVERALL)

(Unless otherwise specified, V_{CC} = +5 V ± 10 %, T_A = -20 °C to +80 °C, C₁ to C₆ = 22 μF)

| Parameter | Symbol | Conditions | MIN. | TYP. | MAX. | Unit |
|----------------------------------|------------------|---|------|------|------|------|
| Circuit current | I _{CC1} | V _{CC} = +5 V, no load, R _{IN} pin open (Standby pin open) | | 9.0 | 18.0 | mA |
| Circuit current | I _{CC2} | V _{CC} = +5 V, R _L = 3kΩ (Dout), D _{IN} = GND, R _{IN} and R _{OUT} pins open (Standby pin open) | | 25.0 | 40.0 | mA |
| Standby circuit current | I _{CC} | V _{CC} = +5 V, no load, R _{IN} pin open (Standby pin high) | | 50 | 120 | μA |
| Standby low-level input voltage | V _L | Note 3 | | | 0.8 | V |
| Standby high-level input voltage | V _H | | 2.0 | | | V |
| Input capacitance | C _{IN} | Driver input and receiver input V _{CC} = +5 V, vs. GND, f = 1 MHz | | | 10 | pF |

* TYP.: Typical (reference) value at T_A = 25 °C.

Note 3. Because the standby pin is internally pulled down, if the standby pin is left open, operating mode is in effect.