

# REPLACEMENT FOR

$\mu$ PD71051

$\mu$ PD71054

$\mu$ PD71055

$\mu$ PD71059

AND COMPATIBLE DEVICES

**NEC**  
NEC Electronics

# AVNET MEMEC REPLACEMENT FOR THE POPULAR $\mu$ PD7105X FAMILY

Following the phase-out of the popular  $\mu$ PD71051,  $\mu$ PD71054,  $\mu$ PD71055,  $\mu$ PD71059 devices from NEC Electronics. Avnet Memec is offering functional substitutes based upon low-cost Gate Array ASIC technologies. The Avnet Memec RD71051, RD71054, RD71055, RD71059 devices come in RoHS compliant QFP packages and are direct replacements for the  $\mu$ PD7150x devices in QFP packages.

## ADVANTAGES OF AVNET MEMEC RD7105X PARTS

The Avnet Memec RD7105x parts give you many advantages:

- direct replacement for the discontinued parts in QFP package
- long time availability
- RoHS compliant
- Worldwide Avnet Memec logistic service and support

## CROSS REFERENCE NEC PARTS

Cross Reference NEC Parts			
Avnet Memec Part	Avnet Memec Order Code	NEC Part	Comment
RD71051	$\mu$ PD65881GB-131-3BS-A	$\mu$ PD71051GB-3B4 $\mu$ PD71051GB-10-3B4	Compatible replacement
RD71051	$\mu$ PD65881GB-131-3BS-A	$\mu$ PD71051C / $\mu$ PD71051C-10 $\mu$ PD71051GU / $\mu$ PD71051GU-10 $\mu$ PD71051L / $\mu$ PD71051L-10	Functional compatible. No compatible package. Redesign to QFP package or adapter necessary.
RD71054	$\mu$ PD65881GB-132-3BS-A	$\mu$ PD71054GB-3B4 $\mu$ PD71054GB-10-3B4	Compatible replacement
RD71054	$\mu$ PD65881GB-132-3BS-A	$\mu$ PD71054C / $\mu$ PD71054C-10 $\mu$ PD71054L / $\mu$ PD71054L-10	Functional compatible. No compatible package. Redesign to QFP package or adapter necessary.
RD71055	$\mu$ PD65881GB-130-3BS-A	$\mu$ PD71055GB-3B4 $\mu$ PD71055GB-10-3B4	Compatible replacement
RD71055	$\mu$ PD65881GB-130-3BS-A	$\mu$ PD71055C / $\mu$ PD71055C-10 $\mu$ PD71055L / $\mu$ PD71055L-10	Functional compatible. No compatible package. Redesign to QFP package or adapter necessary.
RD71059	$\mu$ PD65881GB-120-3BS-A	$\mu$ PD71059GB-3B4 $\mu$ PD71059GB-10-3B4	Compatible replacement
RD71059	$\mu$ PD65881GB-120-3BS-A	$\mu$ PD71059C / $\mu$ PD71059C-10 $\mu$ PD71059GU / $\mu$ PD71059GU-10 $\mu$ PD71059L / $\mu$ PD71059L-10	Functional compatible. No compatible package. Redesign to QFP package or adapter necessary.

## CROSS REFERENCE SIMILAR PARTS

This cross reference table is just a reference of commonly used devices, it is not complete and other similar parts are or have been available. Difference between the listed parts and the Avnet Memec parts may exist. Please see the datasheets of the suppliers for details.

Avnet Memec Part	Industry Equivalent Part	Intersil	Oki	Toshiba
RD71051	82C51	-	MSM82C51A-2	TMP82C51A-2/-10
RD71054	82C54	*82C54	MSM83C54-2	TMP82C54-2
RD71055	82C55	CQ82C55A-5Z IQ82C55AZ	MSM82C55A-2	TMP82C55A-2/-10
RD71059	82C59	*82C59A	MSM82C59A-2	TMP82C59A

## RD71051 - SERIAL CONTROL UNIT (USART) μPD71051 - COMPATIBLE

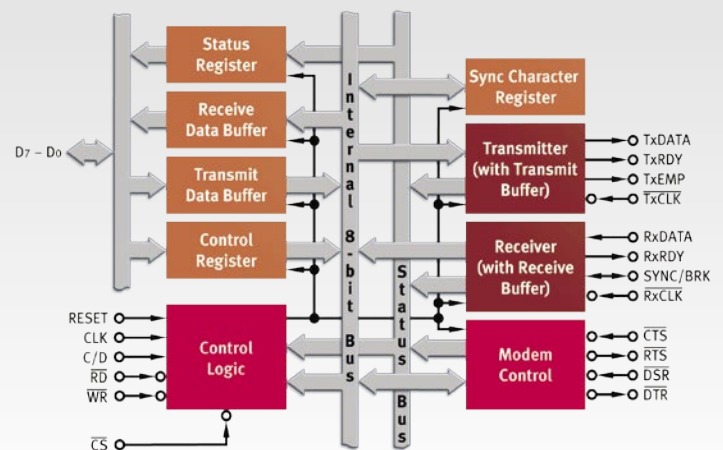
### DESCRIPTION

The RD71051 serial control unit is designed to provide serial data communications in microcomputer systems. The RD71051 is connected via parallel bus to the host CPU and supports synchronous or asynchronous serial data transmission protocols, including IBM bisync. Transmit and receive paths are double buffered. The USART operates in full duplex and signals the CPU when it requires servicing. The status data can be accessed at any time.

### FEATURES

- Synchronous operation
  - One or two SYNC characters
  - Internal/external synchronization
  - Automatic SYNC character insertion
- Asynchronous operation
  - Clock rate (baud rate): x1, x16, or x64
  - Send stop bits: 1, 1.5, or 2 bits
  - Break transmission
  - Automatic break detection
  - Valid start bit detection
- Baud rate: DC ~ 660 kbit/s at x1 clock
- Full duplex, double-buffered transmitter/receiver
- Error detection: parity, overrun, and framing
- Five- to eight-bit characters
- Low-power standby mode
- Power supply: 5V
- Industrial temperature range: -40 to 85°C
- 44-pin QFP package
- RoHS-compliant

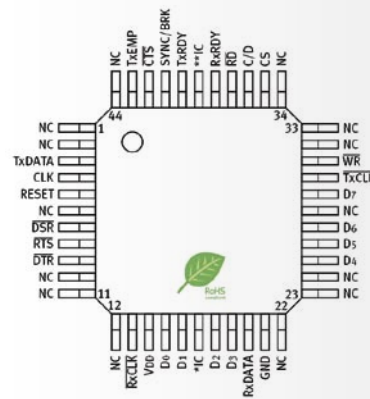
Block Diagramm μPD71051



### PIN IDENTIFICATION

Symbol	Function
TxDATA	Transmit data output
CLK	Clock input
RESET	Reset input
$\overline{DSR}$	Data set ready input
$\overline{RTS}$	Request to send output
$\overline{DTR}$	Data terminal ready output
$\overline{RxCLK}$	Receiver clock input
VDD	+5 V power supply
D7 – D0	Data bus
IC	Internally connected (do not connect any signal to an IC pin)
RxDATA	Receive data input
GND	Ground
$\overline{TxCLK}$	Transmitter clock input
$\overline{WR}$	Write strobe input
$\overline{CS}$	Chip select input
$\overline{C/\overline{D}}$	Control or data input
$\overline{RD}$	Read strobe input
RxRDY	Receiver ready output
TxRDY	Transmitter ready output
SYNC/BRK	Synchronization/break input/output
$\overline{CTS}$	Clear to send input
TxEMP	Transmitter empty output
NC	Not connected

### PIN OUT



\*IC: Can be connected to GND  
\*\*IC: Can be connected to VDD

### ORDER INFORMATION

**Part:** RD71051

**Order Code:**  $\mu$ PD65881GB-131-3BS-A

## RD71054 - PROGRAMMABLE TIMER/COUNTER μPD71054 - COMPATIBLE

### DESCRIPTION

The RD71054 is a high-performance programmable timer/counter device for timing control applications within microcomputer systems.

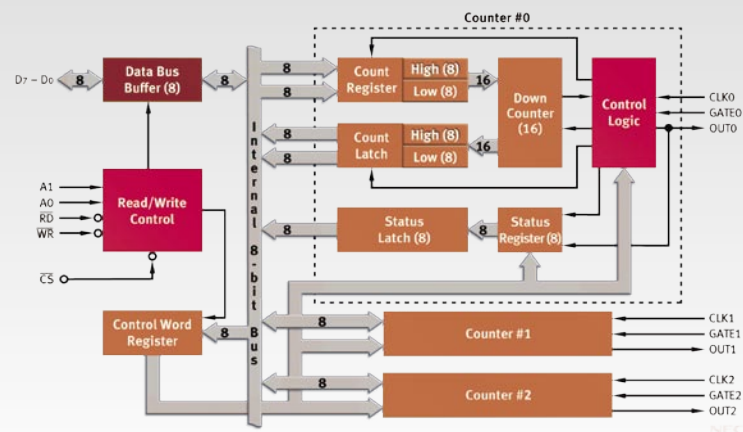
### FEATURES

- Three independently operated 16-bit counters
- Six count modes available for each counter
- Binary/BCD count operation
- Multiple latch command for easy monitoring
- Count rate: 0 (DC) ~ 33 MHz
- Power supply: 5V
- Industrial temperature range: -40 to 85°C
- 44-pin QFP package
- RoHS-compliant

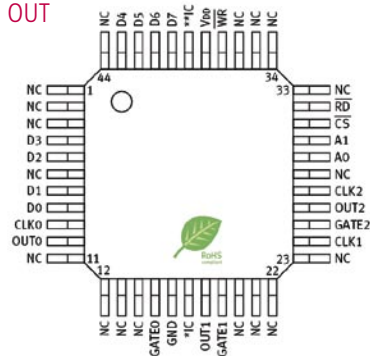
### PIN IDENTIFICATION

Symbol	Function
D7 - D0	Data bus
CLK <sub>n</sub>	Counter clock; n = 0 - 2
OUT <sub>n</sub>	Counter output; n = 0 - 2
GATE <sub>n</sub>	Counter gate; n = 0 - 2
A1, A0	Address
$\overline{CS}$	Chip select
$\overline{RD}$	Read strobe
$\overline{WR}$	Write strobe
VDD	5 V power supply
GND	Ground
IC	Internally connected (do not connect any signal to an IC pin)

### Block Diagramm μPD71054



### PIN OUT



\*IC: Can be connected to GND  
\*\*IC: Can be connected to VDD

### ORDER INFORMATION

**Part:** RD71054

**Order Code:** μPD65881GB-132-3BS-A

## RD71055 - PROGRAMMABLE PARALLEL INTERFACE μPD71055 - COMPATIBLE

### DESCRIPTION

The RD71055 is a programmable parallel interface unit for use in microcomputer systems. It provides three I/O ports and can be used in applications from basic input/output to high level operations using handshaking protocols.

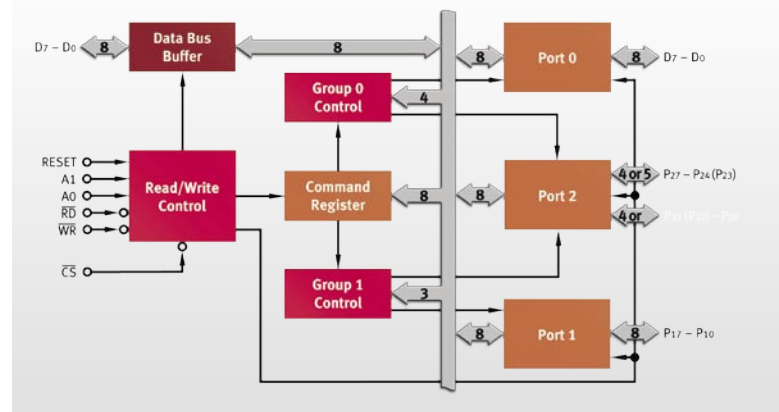
### FEATURES

- Three 8-bit I/O ports
- Three programmable operation modes
- Bit manipulation command
- Power supply: 5V
- Industrial temperature range: -40 to 85°C
- 44-pin QFP package
- RoHS-compliant

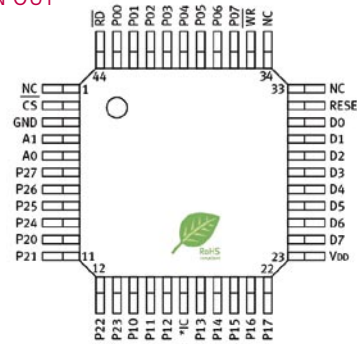
### PIN IDENTIFICATION

Symbol	Function
D7 – D0	Data bus
$\overline{CS}$	Chip select
$\overline{RD}$	Read strobe
$\overline{WR}$	Write strobe
A1, A0	Address
RESET	Reset
P07 to P00	Port 0
P17 to P10	Port 1
P27 to P20	Port 2
IC	Internally connected (do not connect any signal to an IC pin)
VDD	+5 V power supply
GND	Ground
NC	Not connected

### Block Diagramm μPD71055



### PIN OUT



\*IC: Can be connected to GND

### ORDER INFORMATION

**Part:** RD71055  
**Order Code:** μPD65881GB-130-3BS-A

## RD71059 - PROGRAMMABLE INTERRUPT CONTROLLER μPD71059 - COMPATIBLE

### DESCRIPTION

The RD71059 is a programmable interrupt control unit (ICU) for use in microcomputer systems. After processing interrupt request input signals on eight different inputs, each assigned a priority level, the RD71059 relays the request with the highest priority to the CPU. In extended mode it is possible to use multiple μPD71059s to permit processing of up to 64 interrupt request lines.

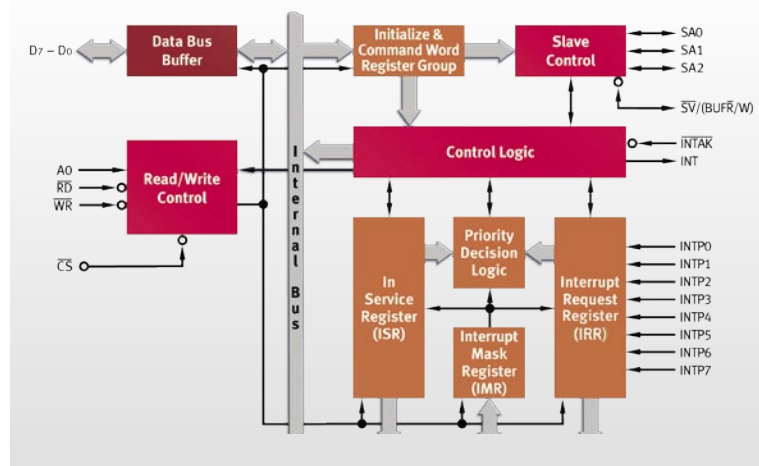
### FEATURES

- Eight interrupt request inputs
- Up to 64 interrupt request inputs (extended mode)
- Interrupt request inputs can be either edge- oder level-triggered
- Masking registers
- Programmable priority levels
- Polling operation possible
- Power supply: 5V
- Industrial temperature range: -40 to 85°C
- 44-pin QFP package
- RoHS-compliant

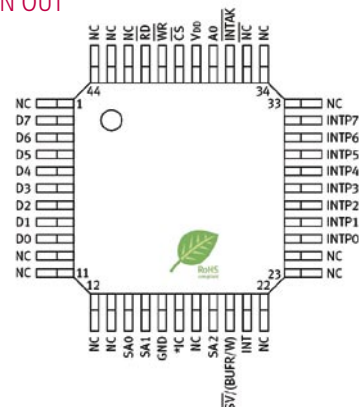
### PIN IDENTIFICATION

Symbol	Function
D7-D0	Data bus
$\overline{CS}$	Chip select
$\overline{RD}$	Read strobe
A0	Address
INTP7-INTP0	Interrupt request from peripheral
INT	Interrupt
$\overline{INTAK}$	Interrupt acknowledge
$\overline{SV}/(\overline{BUFR}/\overline{W})$	Slave/buffer read write
SA2-SA0	Slave address
VDD	+5 V power supply
GND	Ground
IC	Internally connected (do not connect any signal to an IC pin)

Block Diagramm μPD71059



### PIN OUT



\*IC: Can be connected to VDD

### ORDER INFORMATION

**Part:** RD71059  
**Order Code:** μPD65881GB-120-3BS-A

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