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|-------|---|---|
| 32bit | TX19 Family TX19A Series <h1 style="margin: 0;">TMP19A64F20BXBG</h1> |  281pin |
|-------|---|---|

**32-bit high performance RISC microcontroller
containing industry's largest 2-MB Flash memory**



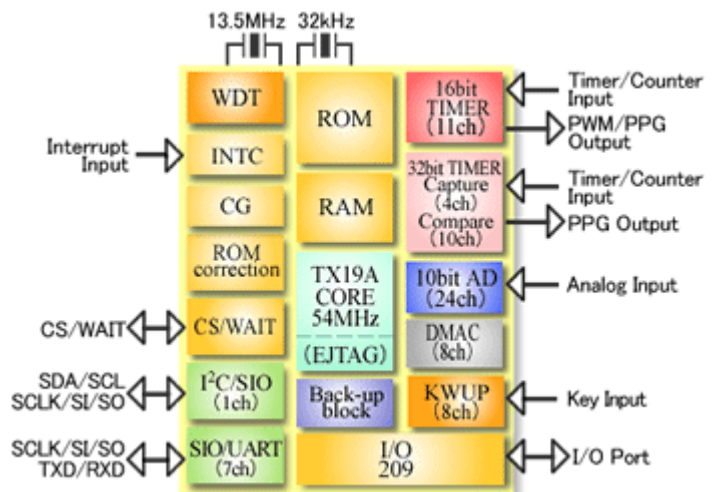
Features

● TX19A CPU Core

- Operating voltage:
I/O = 1.65 to 3.3 V
Internal = 1.35 to 1.65 V
- Maximum Operating frequency:
54 MHz (13.5 MHz × 4 by PLL)
- Internal ROM: 2 Mbytes
- Internal RAM: 64 Kbytes

● Built-in Functions

- 10-bit AD converter : 24 channels
- DMA controller : 8 channels
- 16-bit timer : 11 channels
- 32-bit timer : 1 channel
- Compare register : 10 channels
- Capture register : 4 channels
- SIO/UART : 7 channels
- I²C/SIO : 1 channel
- Key-on wake-up : 8 channels
- Multiplex /separate bus selectable
- ROM correction function
- Back-up block



● Product Lineup

| Part number | ROM | RAM |
|----------------|------------|-----------|
| TMP19A64CIDXBG | 1.5 Mbytes | 56 Kbytes |

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› Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

Development Systems

● Software Products

| Toshiba Integrated Development Environment (TIDE) | | Real-Time OS (μITRON 4.0) |
|--|--|--|
| C Compiler | Integrated Development Environment | |
| SW1ACN0-ZCC: 1 license SW1ACN3-ZCC: 10 licenses | SW00MN0-ZCC: 1 license SW00MN3-ZCC: 10 licenses | SW1ARN5-ZCC: Object code can be freely copied. SW1ARNF-ZCC: Object code can be freely copied. With source code. |

● Hardware Products

| Part number | Emulator |
|-------------|-----------------|
| | TMP19A64F20BXBG |

›The DSU PROBE comes with one download license of the Integrated Development Environment.
›For further information about Toshiba microcomputer development systems, please visit <http://www.semicon.toshiba.co.jp/eng/product/micro/index.html>

Package Information

● Pin Numbers and Names

| Pin No. | Pin Name | Pin No. | Pin Name | Pin No. | Pin Name | Pin No. | Pin Name | Pin No. | Pin Name |
|---------|----------------|---------|-----------------------|---------|-----------------------|---------|------------------|---------|----------------|
| A1 | N.C. | A13 | PN2 | B8 | P75/AN5 | C2 | PCST3 (EJTAG) | C14 | PM7 |
| A2 | VREFL | A14 | PN0 | B9 | PL0 | C3 | P92/AN18 | C15 | PM3 |
| A3 | P90/AN16 | A15 | PM5 | B10 | PL3 | C4 | P95/AN21 | C16 | PK3/KEY3 |
| A4 | P93/AN19 | A16 | PM1 | B11 | P05/TXD6 | C5 | P82/AN10 | C17 | CVCC15 |
| A5 | P80/AN8 | A17 | X2 | B12 | P01/INT1 | C6 | P85/AN13 | C18 | XT2 |
| A6 | P83/AN11 | B1 | AVCC31 | B13 | PN3 | C7 | P72/AN2 | D1 | TD0 (EJTAG) |
| A7 | P70/AN0 | B2 | VREFH | B14 | PN1 | C8 | AVSS | D2 | PCST2 (EJTAG) |
| A8 | P74/AN4 | B3 | P91/AN17 | B15 | PM4 | C9 | PL1 | D3 | DINT (EJTAG) |
| A9 | P07/SCLK6/CTS6 | B4 | P94/AN20 | B16 | PM0 | C10 | PL4 | D4 | DVCC15 |
| A10 | PL2 | B5 | P81/AN9 | B17 | CVSS/BVSS | C11 | P04/INT4 | D5 | P96/AN22 |
| A11 | P06/RXD6 | B6 | P84/AN12 | B18 | X1 | C12 | PN6 | D6 | P86/AN14 |
| A12 | P00/INT0 | B7 | P71/AN1 | C1 | PCST0 (EJTAG) | C13 | PN4 | D7 | P73/AN3 |
| D8 | DVCC15 | F18 | P46/SCOUT | K14 | P11/INT1 | N18 | P14/D12/AD12/A12 | T8 | PD4/TXD4 |
| D9 | DVSS | G1 | RESET | K15 | P13/INT3 | P1 | PE4 | T9 | PC0/TXD0 |
| D10 | PL5 | G2 | TD1 (EJTAG) | K16 | P14/INT4 | P2 | PA2/TB00UT | T10 | PC3/TXD1 |
| D11 | P03/INT3 | G3 | FVCC15 | K17 | DVCC30 | P3 | PA3/TB1IN0/INT7 | T11 | PH4/TCOUT8 |
| D12 | PN7 | G4 | DVSS | K18 | P12/INT2 | P4 | PA4/TB1IN1/INT8 | T12 | PH6 |
| D13 | PN5 | G5 | TOVR/TSTA (EJTAG) | L1 | FVCC3 | P5 | PA5/TB1OUT | T13 | PS3/A3 |
| D14 | PM2 | G6 | BW0 | L2 | P01/TPD1/TPC1 (EJTAG) | P6 | PB6/TBAIN0 | T14 | P61/A9 |
| D15 | DVCC34 | G13 | PK7/KEY7 | L3 | P02/TPD2/TPC2 (EJTAG) | P7 | P62/TC2IN | T15 | P21/A17/A1/A17 |
| D16 | PK2/KEY2 | G14 | BRESET | L4 | P03/TPD3/TPC3 (EJTAG) | P8 | PD6/SCLK4/CTS4 | T16 | P23/A19/A3/A19 |
| D17 | PK4/KEY4 | G15 | P41/CS1 | L5 | PE6/INTA | P9 | PC2/SCLK0/CTS0 | T17 | P00/D0/AD0 |
| D18 | XT1 | G16 | P37/ALE | L6 | PE7/INTB | P10 | PC5/SCLK1/CTS1 | T18 | P01/D1/AD1 |
| E1 | DCLK (EJTAG) | G17 | P35/BUSAK | L13 | P13/D11/AD11/A11 | P11 | P52/A2 | U1 | PB4/TB80UT |
| E2 | PCST1 (EJTAG) | G18 | FVCC15 | L14 | P17/D15/AD15/A15 | P12 | P62/A10 | U2 | PB3/TB70UT |
| E3 | TRST (EJTAG) | H1 | NM1 | L15 | FVCC15 | P13 | P65/A13 | U3 | PB7/TBAIN1 |
| E4 | PCST4 (EJTAG) | H2 | DVCC31 | L16 | P10/INT0 | P14 | P26/A22/A6/A22 | U4 | PF1/S1/SCL |
| E5 | END1AN | H3 | PP7/TPD7 (EJTAG) | L17 | P45/CS5 | P15 | P02/D2/AD2 | U5 | PF5/DRE03 |
| E6 | P97/AN23 | H4 | BW1 | L18 | PJ3/DACK3 | P16 | P10/D8/AD8/A8 | U6 | PG1/TC1IN |
| E7 | P87/AN15 | H5 | PLLOFF | M1 | P00/TPD0/TPC0 (EJTAG) | P17 | P12/D10/AD10/A10 | U7 | P02/RXD3 |
| E8 | P76/AN6 | H6 | TCK (EJTAG) | M2 | P07/TPD7/TPC7 (EJTAG) | P18 | P11/D9/AD9/A9 | U8 | DVCC32 |
| E9 | P77/AN7 | H13 | TEST1 | M3 | P04/TPD4/TPC4 (EJTAG) | R1 | PA0/TB0IN0/INT5 | U9 | PC7/RXD2 |
| E10 | PL6 | H14 | P31/WR | M4 | PE3 | R2 | PA1/TB0IN1/INT6 | U10 | PH1/TCOUT5 |
| E11 | PL7 | H15 | P32/HMR | M5 | PA7/TB30UT | R3 | PF3/DRE02 | U11 | PH5/TCOUT9 |
| E12 | PM6 | H16 | P33/WAIT/RDY | M6 | DVCC32 | R4 | PF4/DACK2 | U12 | P50/A0 |
| E13 | PK6/KEY6 | H17 | P30/RD | M13 | P06/D6/AD6 | R5 | PF7/TB1IN | U13 | P55/A5 |
| E14 | PK5/KEY5 | H18 | P40/CS0 | M14 | P07/D7/AD7 | R6 | P67/TCOUT3 | U14 | DVCC33 |
| E15 | BVCC | J1 | PP2/TPD2 (EJTAG) | M15 | DVSS | R7 | P64/TCOUT0 | U15 | P64/A12 |
| E16 | PK1/KEY1 | J2 | PP3/TPD3 (EJTAG) | M16 | PJ0/DRE02 | R8 | P05/RXD4 | U16 | P20/A16/A0/A16 |
| E17 | PK0/KEY0 | J3 | PP4/TPD4 (EJTAG) | M17 | PJ2/DRE03 | R9 | PC1/RXD0 | U17 | P24/A20/A4/A20 |
| E18 | DVCC15 | J4 | PP5/TPD5 (EJTAG) | M18 | PJ1/DACK2 | R10 | PC4/RXD1 | U18 | FVCC3 |
| F1 | DVSS | J5 | PP6/TPD6 (EJTAG) | N1 | PE5 | R11 | PH3/TCOUT7 | V2 | PB5/TB90UT |
| F2 | TWS (EJTAG) | J6 | FVCC15 | N2 | PE0/TXD5 | R12 | P51/A1 | V3 | PG0/TC0IN |
| F3 | EJE (EJTAG) | J13 | DVSS | N3 | PE2/SCLK5/CTS5 | R13 | P57/A7 | V4 | PF0/S0/SDA |
| F4 | BUSMD | J14 | P47 | N4 | PE1/RXD5 | R14 | P66/A14 | V5 | PG3/TC3IN |
| F5 | BOOT | J15 | N.C. | N5 | PA6/TB20UT | R15 | P25/A21/A5/A21 | V6 | PG6/TCOUT2 |
| F7 | AVSS | J16 | P44/CS4 | N7 | DVSS | R16 | P03/D3/AD3 | V7 | PD1/TXD3 |
| F8 | AVSS | J17 | P36/R/W | N8 | PD7/INT9 | R17 | P04/D4/AD4 | V8 | PD0/SCLK2/CTS2 |
| F9 | AVCC32 | J18 | P34/BUSR0 | N9 | DVCC15 | R18 | P05/D5/AD5 | V9 | PC6/TXD2 |
| F10 | DVCC34 | K1 | PP0/TPD0 (EJTAG) | N10 | DVSS | T1 | PB0/TB40UT | V10 | PH2/TCOUT6 |
| F11 | P02/INT2 | K2 | PP1/TPD1 (EJTAG) | N11 | P56/A6 | T2 | PB1/TB50UT | V11 | PH0/TCOUT4 |
| F12 | DVSS | K3 | P05/TPD5/TPC5 (EJTAG) | N12 | DVSS | T3 | PB2/TB60UT | V12 | PH7 |
| F14 | BUPND | K4 | P06/TPD6/TPC6 (EJTAG) | N14 | P27/A23/A7/A23 | T4 | PF2/SCK | V13 | P54/A4 |
| F15 | P42/CS2 | K5 | DVSS | N15 | P15/D13/AD13/A13 | T5 | PF6/DACK3 | V14 | P60/A8 |
| F16 | P43/CS3 | K6 | DVSS | N16 | TEST3 | T6 | P65/TCOUT1 | V15 | P63/A11 |
| F17 | DVCC33 | K13 | TEST2 | N17 | P16/D14/AD14/A14 | T7 | PD3/SCLK3/CTS3 | V16 | P67/A15 |
| | | | | | | | | V17 | P22/A18/A2/A18 |

● Pin Assignments

| | | | | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----------|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| A1 | A2 | A3 | A4 | A5 | A6 | A7 | A8 | A9 | A10 | A11 | A12 | A13 | A14 | A15 | A16 | A17 | |
| B1 | B2 | B3 | B4 | B5 | B6 | B7 | B8 | B9 | B10 | B11 | B12 | B13 | B14 | B15 | B16 | B17 | B18 |
| C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 | C14 | C15 | C16 | C17 | C18 |
| D1 | D2 | D3 | D4 | D5 | D6 | D7 | D8 | D9 | D10 | D11 | D12 | D13 | D14 | D15 | D16 | D17 | D18 |
| E1 | E2 | E3 | E4 | E5 | E6 | E7 | E8 | E9 | E10 | E11 | E12 | E13 | E14 | E15 | E16 | E17 | E18 |
| F1 | F2 | F3 | F4 | F5 | | F7 | F8 | F9 | F10 | F11 | F12 | | F14 | F15 | F16 | F17 | F18 |
| G1 | G2 | G3 | G4 | G5 | G6 | Top View | | | | | | G13 | G14 | G15 | G16 | G17 | G18 |
| H1 | H2 | H3 | H4 | H5 | H6 | | | | | | | H13 | H14 | H15 | H16 | H17 | H18 |
| J1 | J2 | J3 | J4 | J5 | J6 | | | | | | | J13 | J14 | J15 | J16 | J17 | J18 |
| K1 | K2 | K3 | K4 | K5 | K6 | | | | | | | K13 | K14 | K15 | K16 | K17 | K18 |
| L1 | L2 | L3 | L4 | L5 | L6 | | | | | | | L13 | L14 | L15 | L16 | L17 | L18 |
| M1 | M2 | M3 | M4 | M5 | M6 | | | | | | | M13 | M14 | M15 | M16 | M17 | M18 |
| N1 | N2 | N3 | N4 | N5 | | N7 | N8 | N9 | N10 | N11 | N12 | | N14 | N15 | N16 | N17 | N18 |
| P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 | P9 | P10 | P11 | P12 | P13 | P14 | P15 | P16 | P17 | P18 |
| R1 | R2 | R3 | R4 | R5 | R6 | R7 | R8 | R9 | R10 | R11 | R12 | R13 | R14 | R15 | R16 | R17 | R18 |
| T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 | T9 | T10 | T11 | T12 | T13 | T14 | T15 | T16 | T17 | T18 |
| U1 | U2 | U3 | U4 | U5 | U6 | U7 | U8 | U9 | U10 | U11 | U12 | U13 | U14 | U15 | U16 | U17 | U18 |
| | V2 | V3 | V4 | V5 | V6 | V7 | V8 | V9 | V10 | V11 | V12 | V13 | V14 | V15 | V16 | V17 | |

Package name FBGA281-P-1313-0.65B6

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