

74LVT2244, 74LVTH2244 Low Voltage Octal Buffer/Line Driver with 3-STATE Outputs and 25Ω Series Resistors in the Outputs

Features

- Input and output interface capability to systems at 5V V_{CC}
- Equivalent 25Ω-Series resistors on outputs
- Bushold data inputs eliminate the need for external pull-up resistors to hold unused inputs (74LVTH2244), also available without bushold feature (74LVT2244)
- Live insertion/extraction permitted
- Power Up/Down high impedance provides glitch-free bus loading
- Outputs source/sink –12mA/+12mA
- Latch-up performance exceeds 500mA
- ESD performance:
 - Human-body model > 2000V
 - Machine model > 200V
 - Charged-device model > 1000V

General Description

The LVT2244 and LVTH2244 are octal buffers and line drivers designed to be employed as memory address drivers, clock drivers and bus oriented transmitters or receivers which provides improved PC board density. The equivalent 25Ω-Series resistors helps reduce output overshoot and undershoot.


The LVTH2244 data inputs include bushold, eliminating the need for external pull-up resistors to hold unused inputs.

These octal buffers and line drivers are designed for low-voltage (3.3V) V_{CC} applications, but with the capability to provide a TTL interface to a 5V environment. The LVT2244 and LVTH2244 are fabricated with an advanced BiCMOS technology to achieve high speed operation similar to 5V ABT while maintaining low power dissipation.

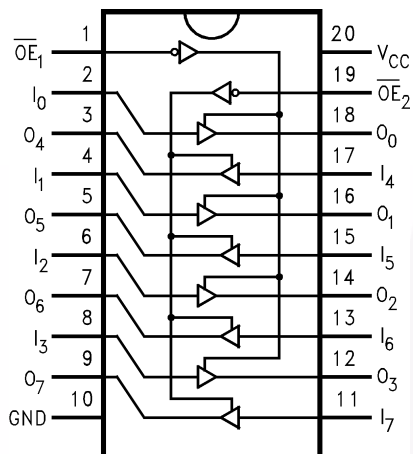
Ordering Information

| Order Number | Package Number | Package Description |
|---------------|----------------|---|
| 74LVT2244WM | M20B | 20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300" Wide |
| 74LVT2244SJ | M20D | 20-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide |
| 74LVT2244MTC | MTC20 | 20-Lead Thin Shrink Small Outline Package (TSSOP), JEDEC MO-153, 4.4mm Wide |
| 74LVTH2244WM | M20B | 20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300" Wide |
| 74LVTH2244SJ | M20D | 20-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide |
| 74LVTH2244MTC | MTC20 | 20-Lead Thin Shrink Small Outline Package (TSSOP), JEDEC MO-153, 4.4mm Wide |

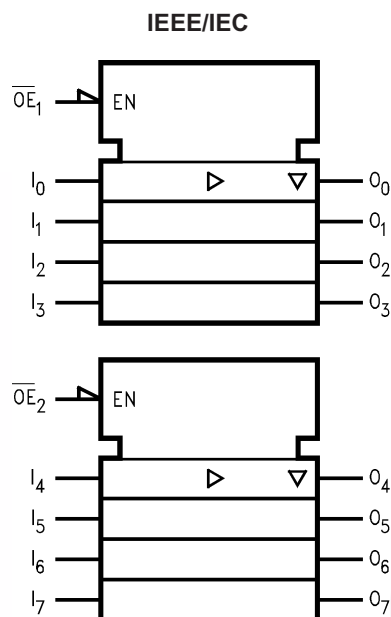
Device also available in Tape and Reel. Specify by appending suffix letter "X" to the ordering number.

 All packages are lead free per JEDEC: J-STD-020B standard.

Connection Diagram



Logic Symbol



Pin Description

| Pin Names | Description |
|------------------------------------|------------------------------|
| $\overline{OE}_1, \overline{OE}_2$ | 3-STATE Output Enable Inputs |
| I_0-I_7 | Inputs |
| O_0-O_7 | Outputs |

Truth Tables

| Inputs | | Outputs (Pins 12, 14, 16, 18) |
|-------------------|-------|----------------------------------|
| \overline{OE}_1 | I_n | |
| L | L | L |
| L | H | H |
| H | X | Z |

| Inputs | | Outputs (Pins 3, 5, 7, 9) |
|-------------------|-------|------------------------------|
| \overline{OE}_2 | I_n | |
| L | L | L |
| L | H | H |
| H | X | Z |

H = HIGH Voltage Level

L = LOW Voltage Level

X = Immaterial

Z = High Impedance

Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only.

| Symbol | Parameter | Rating |
|-----------|---|-----------------|
| V_{CC} | Supply Voltage | -0.5V to +4.6V |
| V_I | DC Input Voltage | -0.5V to +7.0V |
| V_O | DC Output Voltage Output in 3-STATE | -0.5V to +7.0V |
| | Output in HIGH or LOW State ⁽¹⁾ | -0.5V to +7.0V |
| I_{IK} | DC Input Diode Current, $V_I < GND$ | -50mA |
| I_{OK} | DC Output Diode Current, $V_O < GND$ | -50mA |
| I_O | DC Output Current, $V_O > V_{CC}$ Output at HIGH State | 64mA |
| | Output at LOW State | 128mA |
| I_{CC} | DC Supply Current per Supply Pin | ±64mA |
| I_{GND} | DC Ground Current per Ground Pin | ±128mA |
| T_{STG} | Storage Temperature | -65°C to +150°C |

Note:

- I_O Absolute Maximum Rating must be observed.

Recommended Operating Conditions

The Recommended Operating Conditions table defines the conditions for actual device operation. Recommended operating conditions are specified to ensure optimal performance to the datasheet specifications. Fairchild does not recommend exceeding them or designing to absolute maximum ratings.

| Symbol | Parameter | Min. | Max. | Units |
|-----------------------|---|------|------|-------|
| V_{CC} | Supply Voltage | 2.7 | 3.6 | V |
| V_I | Input Voltage | 0 | 5.5 | V |
| I_{OH} | HIGH-Level Output Current | | -12 | mA |
| I_{OL} | LOW-Level Output Current | | 12 | mA |
| T_A | Free-Air Operating Temperature | -40 | 85 | °C |
| $\Delta t / \Delta V$ | Input Edge Rate, $V_{IN} = 0.8V-2.0V$, $V_{CC} = 3.0V$ | 0 | 10 | ns/V |

DC Electrical Characteristics

| Symbol | Parameter | V _{CC} (V) | Conditions | T _A = -40°C to +85°C | | | Units | |
|-------------------------------------|--|---------------------|---|--|---------------------|------|-------|----|
| | | | | Min. | Typ. ⁽²⁾ | Max. | | |
| V _{IK} | Input Clamp Diode Voltage | 2.7 | I _I = -18mA | | | -1.2 | V | |
| V _{IH} | Input HIGH Voltage | 2.7–3.6 | V _O ≤ 0.1V or V _O ≥ V _{CC} - 0.1V | 2.0 | | | V | |
| V _{IL} | Input LOW Voltage | 2.7–3.6 | | | | 0.8 | V | |
| V _{OH} | Output HIGH Voltage | 2.7–3.6 | I _{OH} = -100μA | V _{CC} - 0.2 | | | V | |
| | | 3.0 | I _{OH} = -12mA | 2.0 | | | | |
| V _{OL} | Output LOW Voltage | 2.7 | I _{OL} = 100μA | | | 0.2 | V | |
| | | 3.0 | I _{OL} = 12mA | | | 0.8 | | |
| I _{I(HOLD)} ⁽³⁾ | Bushold Input Minimum Drive | 3.0 | V _I = 0.8V | 75 | | | μA | |
| | | | V _I = 2.0V | -75 | | | | |
| I _{I(OD)} ⁽³⁾ | Bushold Input Over-Drive Current to Change State | 3.0 | ⁽⁴⁾ | 500 | | | μA | |
| | | | ⁽⁵⁾ | -500 | | | | |
| I _I | Input Current | 3.6 | V _I = 5.5V | | | 10 | μA | |
| | | | Control Pins | V _I = 0V or V _{CC} | | | | ±1 |
| | | | Data Pins | V _I = 0V | | | | -5 |
| | | | | V _I = V _{CC} | | | | 1 |
| I _{OFF} | Power Off Leakage Current | 0 | 0V ≤ V _I or V _O ≤ 5.5V | | | ±100 | μA | |
| I _{PU/PD} | Power up/down 3-STATE Output Current | 0–1.5 | V _O = 0.5V to 3.0V, V _I = GND or V _{CC} | | | ±100 | μA | |
| I _{OZL} | 3-STATE Output Leakage Current | 3.6 | V _O = 0.5V | | | -5 | μA | |
| I _{OZH} | 3-STATE Output Leakage Current | 3.6 | V _O = 3.0V | | | 5 | μA | |
| I _{OZH+} | 3-STATE Output Leakage Current | 3.6 | V _{CC} < V _O ≤ 5.5V | | | 10 | μA | |
| I _{CCCH} | Power Supply Current | 3.6 | Outputs HIGH | | | 0.19 | mA | |
| I _{CCCL} | Power Supply Current | 3.6 | Outputs LOW | | | 5 | mA | |
| I _{CCZ} | Power Supply Current | 3.6 | Outputs Disabled | | | 0.19 | mA | |
| I _{CCZ+} | Power Supply Current | 3.6 | V _{CC} ≤ V _O ≤ 5.5V, Outputs Disabled | | | 0.19 | mA | |
| ΔI _{CC} | Increase in Power Supply Current ⁽⁶⁾ | 3.6 | One Input at V _{CC} - 0.6V, Other Inputs at V _{CC} or GND | | | 0.2 | mA | |

Notes:

- All typical values are at V_{CC} = 3.3V, T_A = 25°C.
- Applies to bushold versions only (74LVTH2244).
- An external driver must source at least the specified current to switch from LOW-to-HIGH.
- An external driver must sink at least the specified current to switch from HIGH-to-LOW.
- This is the increase in supply current for each, input that is at the specified voltage level rather than V_{CC} or GND.

Dynamic Switching Characteristics⁽⁷⁾

| Symbol | Parameter | V _{CC} (V) | Conditions | T _A = 25°C | | | Units |
|------------------|--|---------------------|--|-----------------------|------|------|-------|
| | | | C _L = 50pF, R _L = 500Ω | Min. | Typ. | Max. | |
| V _{OLP} | Quiet Output Maximum Dynamic V _{OL} | 3.3 | (8) | | 0.8 | | V |
| V _{OLV} | Quiet Output Minimum Dynamic V _{OL} | 3.3 | (8) | | -0.8 | | V |

Notes:

7. Characterized in SOIC package. Guaranteed parameter, but not tested.
 8. Max number of outputs defined as (n). n-1 data inputs are driven 0V to 3V. Output under test held LOW.

AC Electrical Characteristics

| Symbol | Parameter | T _A = -40°C to +85°C, C _L = 50pF, R _L = 500Ω | | | | | Units |
|---------------------------------------|---------------------------------------|--|---------------------|------|------------------------|------|-------|
| | | V _{CC} = 3.3V ± 0.3V | | | V _{CC} = 2.7V | | |
| | | Min. | Typ. ⁽⁹⁾ | Max. | Min. | Max. | |
| t _{PLH} | Propagation Delay Data to Output | 1.0 | | 4.4 | 1.0 | 5.3 | ns |
| t _{PHL} | | 1.0 | | 4.1 | 1.0 | 4.4 | |
| t _{PZH} | Output Enable Time | 1.0 | | 5.9 | 1.0 | 7.7 | ns |
| t _{PZL} | | 1.1 | | 5.5 | 1.1 | 6.2 | |
| t _{PHZ} | Output Disable Time | 1.9 | | 6.1 | 1.9 | 6.8 | ns |
| t _{PLZ} | | 1.8 | | 4.5 | 1.8 | 4.5 | |
| t _{OSSL} , t _{OSLH} | Output to Output Skew ⁽¹⁰⁾ | | | 1.0 | | 1.0 | ns |

Notes:

9. All typical values are at V_{CC} = 3.3V, T_A = 25°C.
 10. Skew is defined as the absolute value of the difference between the actual propagation delay for any two separate outputs of the same device. The specification applies to any outputs switching in the same direction, either HIGH-to-LOW (t_{OSSL}) or LOW-to-HIGH (t_{OSLH}).

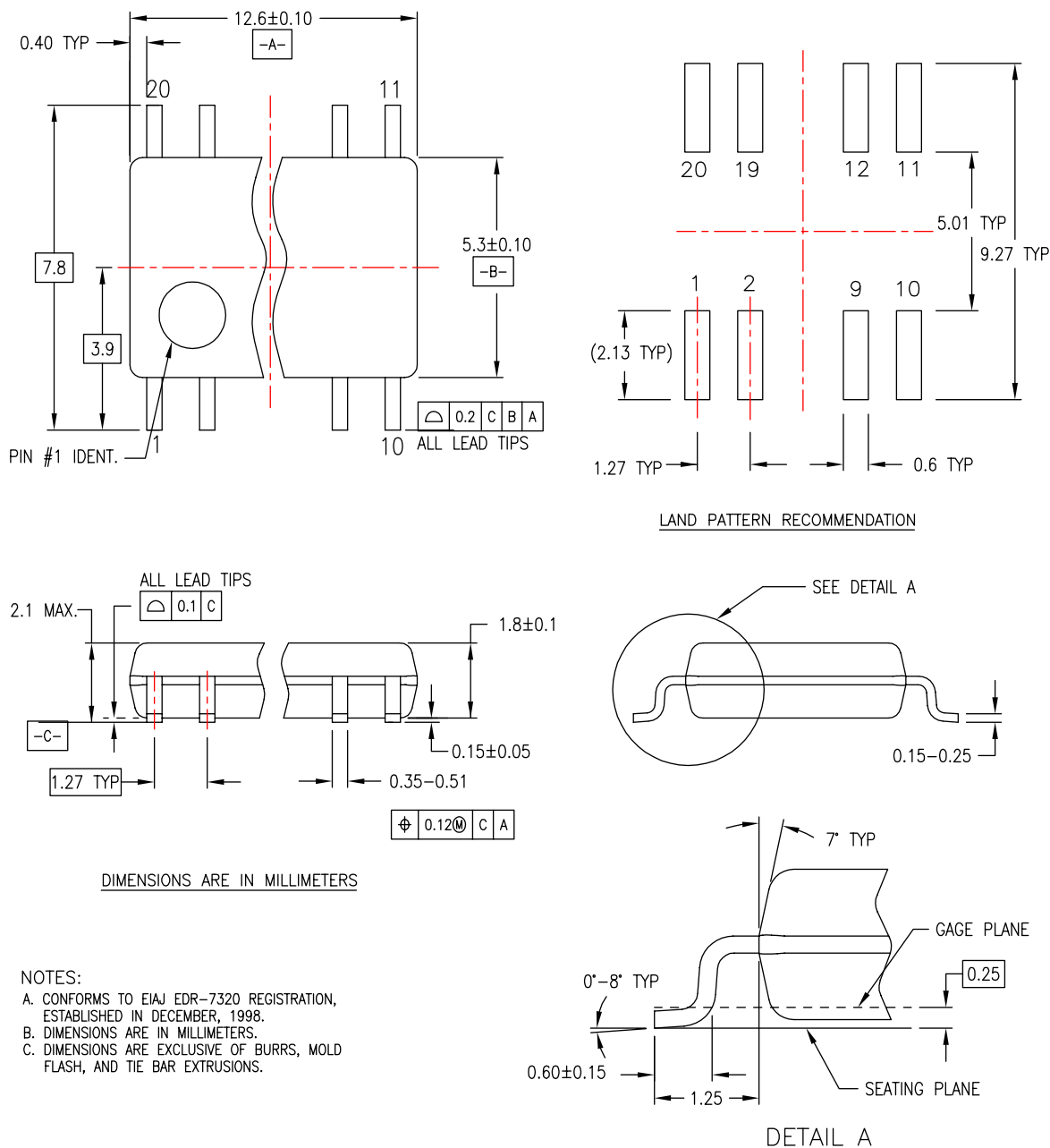
Capacitance⁽¹¹⁾

| Symbol | Parameter | Conditions | Typical | Units |
|------------------|--------------------|--|---------|-------|
| C _{IN} | Input Capacitance | V _{CC} = 0V, V _I = 0V or V _{CC} | 3 | pF |
| C _{OUT} | Output Capacitance | V _{CC} = 3.0V, V _O = 0V or V _{CC} | 6 | pF |

Note:

11. Capacitance is measured at frequency f = 1MHz, per MIL-STD-883B, Method 3012.

Physical Dimensions (Continued)



NOTES:

- A. CONFORMS TO EIAJ EDR-7320 REGISTRATION, ESTABLISHED IN DECEMBER, 1998.
- B. DIMENSIONS ARE IN MILLIMETERS.
- C. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.

M20DREVC

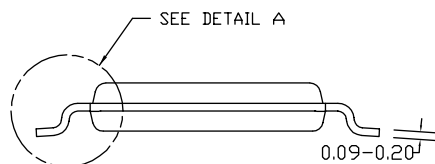
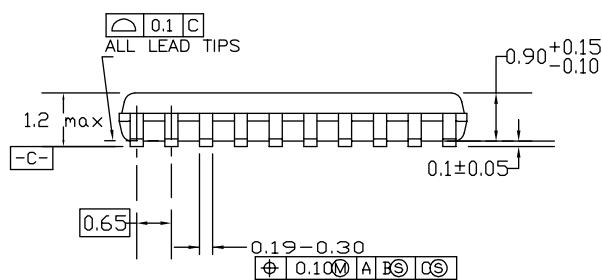
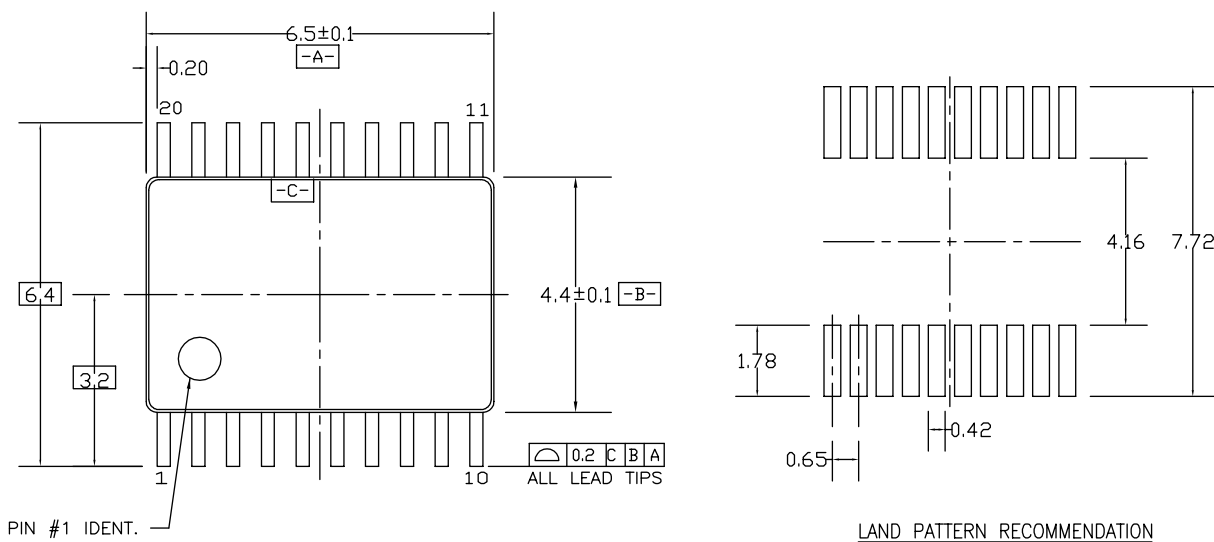
Figure 2. 20-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide

Package drawings are provided as a service to customers considering Fairchild components. Drawings may change in any manner without notice. Please note the revision and/or date on the drawing and contact a Fairchild Semiconductor representative to verify or obtain the most recent revision. Package specifications do not expand the terms of Fairchild's worldwide terms and conditions, specifically the warranty therein, which covers Fairchild products.

Always visit Fairchild Semiconductor's online packaging area for the most recent package drawings:

<http://www.fairchildsemi.com/packaging/>

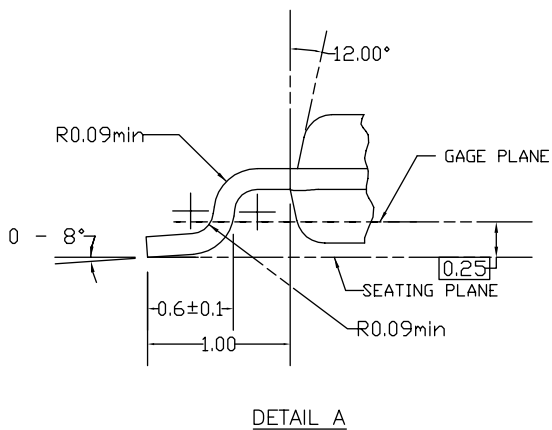
Physical Dimensions (Continued)



DIMENSIONS ARE IN MILLIMETERS

NOTES:

- A. CONFORMS TO JEDEC REGISTRATION MO-153, VARIATION AC, REF NOTE 6, DATE 7/93.
- B. DIMENSIONS ARE IN MILLIMETERS.
- C. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLDS FLASH, AND TIE BAR EXTRUSIONS.
- D. DIMENSIONS AND TOLERANCES PER ANSI Y14.5M, 1982.



MTC20REV D1

Figure 3. 20-Lead Thin Shrink Small Outline Package (TSSOP), JEDEC MO-153, 4.4mm Wide

Package drawings are provided as a service to customers considering Fairchild components. Drawings may change in any manner without notice. Please note the revision and/or date on the drawing and contact a Fairchild Semiconductor representative to verify or obtain the most recent revision. Package specifications do not expand the terms of Fairchild's worldwide terms and conditions, specifically the warranty therein, which covers Fairchild products.



Always visit Fairchild Semiconductor's online packaging area for the most recent package drawings:

<http://www.fairchildsemi.com/packaging/>



TRADEMARKS

The following includes registered and unregistered trademarks and service marks, owned by Fairchild Semiconductor and/or its global subsidiaries, and is not intended to be an exhaustive list of all such trademarks.

- | | | | |
|---|--|--|----------------------------------|
| ACEx [®] | FPS [™] | PDP-SPM [™] | SupreMOS [™] |
| Build it Now [™] | FRFET [®] | Power220 [®] | SyncFET [™] |
| CorePLUS [™] | Global Power Resource SM | POWEREDGE [®] | SYSTEM [®] |
| CROSSVOLT [™] | Green FPS [™] | Power-SPM [™] | GENERAL [®] |
| CTL [™] | Green FPS [™] e-Series [™] | PowerTrench [®] | The Power Franchise [®] |
| Current Transfer Logic [™] | GTO [™] | Programmable Active Droop [™] | power [®] |
| EcoSPARK [®] | i-Lo [™] | QFET [®] | the franchise |
| EZSWITCH [™] * | IntelliMAX [™] | QS [™] | TinyBoost [™] |
|  | ISOPLANAR [™] | QT Optoelectronics [™] | TinyBuck [™] |
|  | MegaBuck [™] | Quiet Series [™] | TinyLogic [®] |
| Fairchild [®] | MICROCOUPLER [™] | RapidConfigure [™] | TINYOPTO [™] |
| Fairchild Semiconductor [®] | MicroFET [™] | SMART START [™] | TinyPower [™] |
| FACT Quiet Series [™] | MicroPak [™] | SPM [®] | TinyPWM [™] |
| FACT [®] | MillerDrive [™] | STEALTH [™] | TinyWire [™] |
| FAST [®] | Motion-SPM [™] | SuperFET [™] | μSerDes [™] |
| FastvCore [™] | OPTOLOGIC [®] | SuperSOT [™] 3 | UHC [®] |
| FlashWriter [®] * | OPTOPLANAR [®] | SuperSOT [™] 6 | Ultra FRFET [™] |
| | | SuperSOT [™] 8 | UniFET [™] |
| | | | VCX [™] |

* EZSWITCH[™] and FlashWriter[®] are trademarks of System General Corporation, used under license by Fairchild Semiconductor.

DISCLAIMER

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION, OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS. THESE SPECIFICATIONS DO NOT EXPAND THE TERMS OF FAIRCHILD'S WORLDWIDE TERMS AND CONDITIONS, SPECIFICALLY THE WARRANTY THEREIN, WHICH COVERS THESE PRODUCTS.

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF FAIRCHILD SEMICONDUCTOR CORPORATION.

As used herein:

- Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
- A critical component in any component of a life support, device, or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

PRODUCT STATUS DEFINITIONS

Definition of Terms

| Datasheet Identification | Product Status | Definition |
|--------------------------|------------------------|--|
| Advance Information | Formative or In Design | This datasheet contains the design specifications for product development. Specifications may change in any manner without notice. |
| Preliminary | First Production | This datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design. |
| No Identification Needed | Full Production | This datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve the design. |
| Obsolete | Not In Production | This datasheet contains specifications on a product that has been discontinued by Fairchild Semiconductor. The datasheet is printed for reference information only. |

Rev. I33

Данный компонент на территории Российской Федерации

Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru

moschip.ru_4

moschip.ru_6

moschip.ru_9