

FSAV332 — Quad Video Switch with Individual Enables

Features

- Wide Bandwidth: 368MHz
- -84dB Non-adjacent Channel Crosstalk at 10MHz
- -49dB Off-Isolation at 10MHz
- 3Ω Typical On Resistance (R_{ON})
- Low-Power Consumption: 3μA Maximum
- Control Input: TTL Compatible

Description

The FSAV332 video switch is a quad high-speed video switch. Low on resistance allows inputs to be connected to outputs without adding propagation delay or generating additional ground bounce noise.


The device is organized as four one-bit switches with separate output enable (/OE) pins. When OE is LOW, the switch is ON and port A is connected to port B. When OE is HIGH, the switch is OPEN and a high-impedance state exists between the two ports.

Applications

- Y/C Video or CVBS Video Switch in LCD Plasma, or Projector Displays

Ordering Information

| Part Number | Operating Temperature Range | Package | Packing Method |
|-------------|-----------------------------|--|----------------|
| FSAV332MTC | -40 to +85°C | 14-Lead, Thin Shrink Small Outline Package (TSSOP), JEDEC MO-153, 4.4mm Wide | Tube |
| FSAV332MTCX | -40 to +85°C | 14-Lead, Thin Shrink Small Outline Package (TSSOP), JEDEC MO-153, 4.4mm Wide | Tape and Reel |
| FSAV332QSC | -40 to +85°C | 16-Lead, Quarter Size Outline Package (QSOP), JEDEC MO-137, 0.150 inch Wide | Tube |
| FSAV332QSCX | -40 to +85°C | 16-Lead, Quarter Size Outline Package (QSOP), JEDEC MO-137, 0.150 inch Wide | Tape and Reel |

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

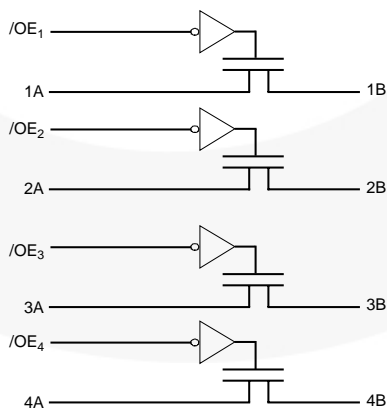


Figure 1. Logic Diagram

Pin Assignments

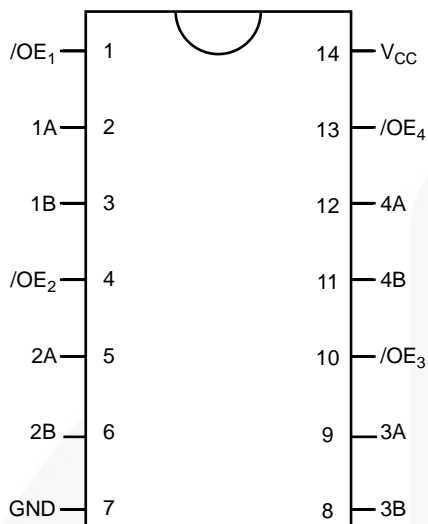


Figure 2. TSSOP Pin Assignments

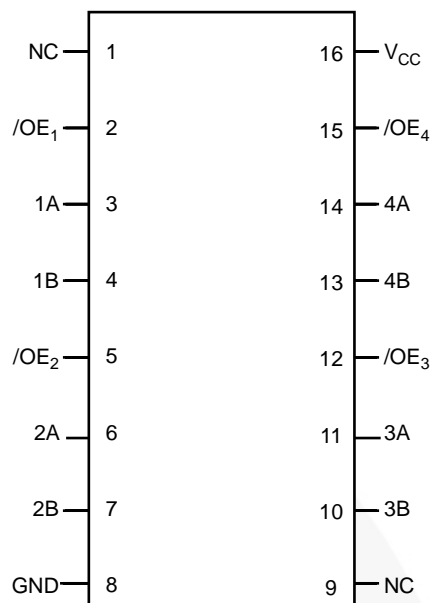


Figure 3. QSOP Pin Assignments

Pin Descriptions

| Pin Names | Description |
|---|--------------------|
| /OE ₁ , /OE ₂ , /OE ₃ , /OE ₄ | Bus Switch Enables |
| 1A, 2A, 3A, 4A | Bus A |
| 1B, 2B, 3B, 4B | Bus B |
| NC | Not Connected |
| V _{CC} | Supply Voltage |
| GND | Ground |

Truth Table

| Inputs | Inputs/Outputs |
|--------|----------------|
| /OE | A, B |
| LOW | A = B |
| HIGH | 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 | Min. | Max. | Unit |
|------------------|----------------------------------|------|-----------------------|------|
| V _{CC} | Supply Voltage | -0.5 | 7.0 | V |
| V _S | DC Switch Voltage ⁽¹⁾ | -0.5 | V _{CC} + 0.5 | V |
| V _{IN} | DC Input Voltage ⁽¹⁾ | -0.5 | 7.0 | V |
| I _{IK} | DC Input Diode Current | -50 | | mA |
| I _{OUT} | DC Output Current | | 128 | mA |
| T _{STG} | Storage Temperature Range | -65 | +150 | °C |
| ESD | Human Body Model, JESD22-A114 | | 4000 | V |

Note:

- The input and output negative voltage ratings may be exceeded if the input and output diode current ratings are 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. | Unit |
|-----------------|--------------------------------------|-------|-----------------|------|
| V _{CC} | Power Supply | 4.75 | 5.25 | V |
| V _{IN} | Control Input Voltage ⁽²⁾ | 0 | V _{CC} | V |
| V _S | Switch Input Voltage | 0 | V _{CC} | V |
| T _A | Operating Temperature | -40 | +85 | °C |
| Θ _{JA} | Thermal Resistance | TSSOP | +115 | °C/W |
| | | QSOP | +127 | |

Note:

- Unused control inputs must be held HIGH or LOW; they may not float.

DC Electrical Characteristics

All typical values are for $V_{CC}=5.0V$ and $25^{\circ}C$, unless otherwise noted.

| Symbol | Parameter | Conditions | V_{CC} (V) | Min. | Typ. | Max. | Units |
|--------------|-------------------------------------|--|--------------|------|------|-----------|----------|
| V_{ANALOG} | Analog Signal Range | | 4.75 to 5.25 | 0 | | 2 | V |
| V_{IK} | Clamp Diode Voltage | $I_{IN}=-18mA$ | 4.75 | | | -1.2 | V |
| V_{IH} | High-Level Input Voltage | | 4.75 to 5.25 | 2.0 | | | V |
| V_{IL} | Low-Level Input Voltage | | 4.75 to 5.25 | | | 0.8 | V |
| I_{IN} | Input Leakage Current | $V_{IN} = 0V$ to V_{CC} | 5.25 | | | ± 1.0 | μA |
| I_{OZ} | Off-state Leakage Current | $0 \leq A, B \leq V_{CC}$ | 5.25 | | | ± 1.0 | μA |
| R_{ON} | Switch On Resistance ⁽³⁾ | $V_{IN}=1V, R_L=75\Omega, I_{ON}=13mA$ | 4.75 | | 3 | 7 | Ω |
| | | $V_{IN}=2V, R_L=75\Omega, I_{ON}=26mA$ | 4.75 | | 7 | 10 | |
| I_{CC} | Quiescent Supply Current | $V_{IN}= 0V$ V_{CC} or $I_{OUT}=0$ | 5.25 | | | 3 | μA |

Note:

3. Measured by the voltage drop between the A and B pins at the indicated current through the switch. On resistance is determined by the lower of the voltages on the A or B pins.

AC Electrical Characteristics

All typical values are for $V_{CC}=5.0V$ at $T_A=25^{\circ}C$, unless otherwise noted.

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Units | Figure |
|--------------------|----------------------------------|--|------|------|------|------------|----------------------|
| t_{ON} | Turn-on Time | $V_{IN}=7V$ for t_{PZL} , $V_{IN}=Open$ for t_{PZH} | 1.0 | | 5.0 | ns | Figure 4 Figure 5 |
| t_{OFF} | Turn-off Time | $V_{IN}=7V$ for t_{PZL} , $V_{IN}=Open$ for t_{PZH} | 1.0 | | 5.0 | ns | Figure 4 Figure 5 |
| t_{PLH}, t_{PHL} | Propagation Delay ⁽⁴⁾ | $V_{IN}=Open$ | | | 0.1 | ns | Figure 4 Figure 5 |
| D_G | Differential Gain | $R_L=150\Omega, f=3.58MHz$ | | 0.29 | | % | |
| D_P | Differential Phase | $R_L=150\Omega, f=3.58MHz$ | | 0.1 | | $^{\circ}$ | |
| O_{IRR} | Off Isolation | $f=10MHz, R_L=150\Omega$ | | -84 | | dB | Figure 6 |
| X_{TALK} | Crosstalk | $R_L=150\Omega, f=10MHz$ | | -54 | | dB | Figure 7 |
| B_W | -3dB Bandwidth | $R_L=150\Omega$ | | 368 | | MHz | Figure 8 |

Note:

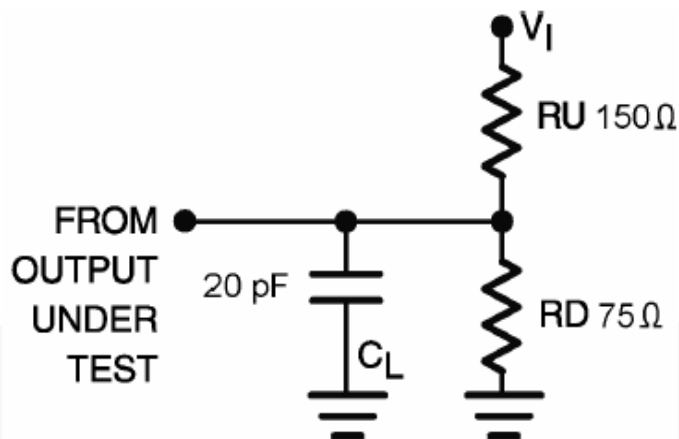
4. This parameter is guaranteed by design.

Capacitance

All typical values are for $T_A= -40$ to $+85^{\circ}C$.

| Symbol | Parameter | Conditions | Typ. | Units |
|-----------|-------------------------------|-------------------------|------|-------|
| C_{IN} | Control Pin Input Capacitance | $V_{CC}=5.0V$ | 3.0 | pF |
| C_{ON} | A/B On Capacitance | $V_{CC}=5.0V, /OE=0V$ | 30.0 | pF |
| C_{OFF} | Port B Off Capacitance | V_{CC} and $/OE=5.0V$ | 5.0 | pF |

AC Loadings and Waveforms



Notes: Input drive by 50Ω source terminated in 50Ω.
 C_L includes load and stray capacitance.
 Input PRR=1.0MHz, $t_w=500ns$.

Figure 4. AC Test Circuit

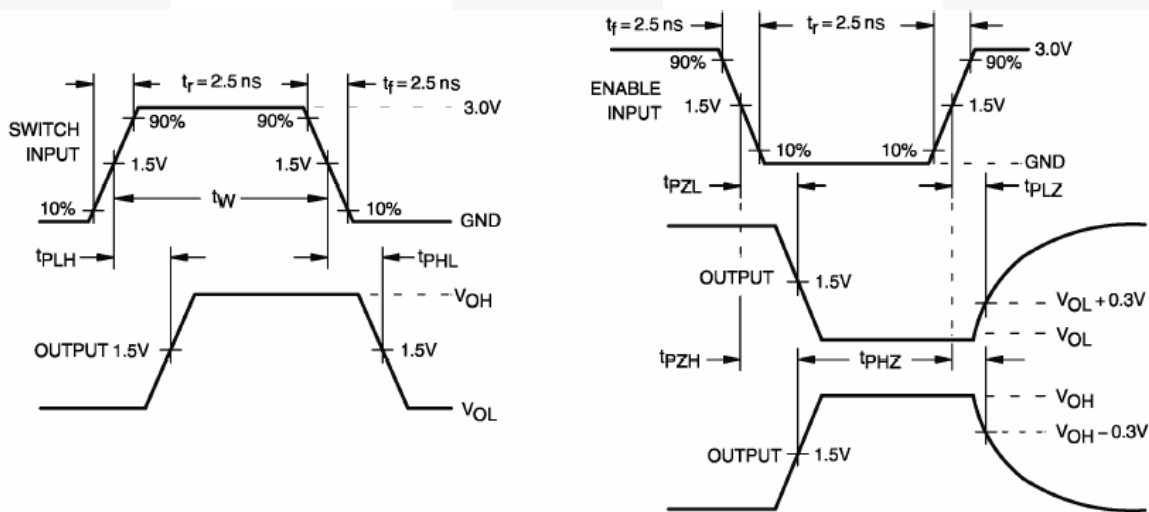


Figure 5. AC Waveforms

Test Diagrams

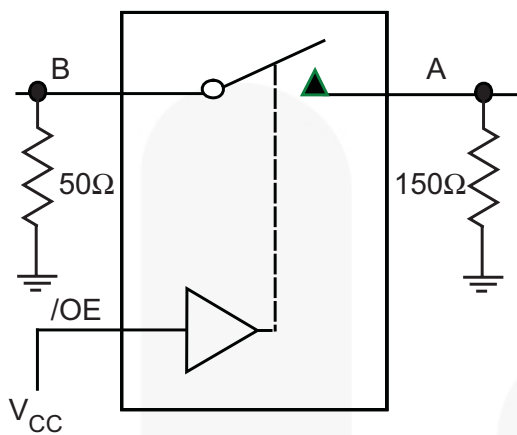


Figure 6. Off Isolation

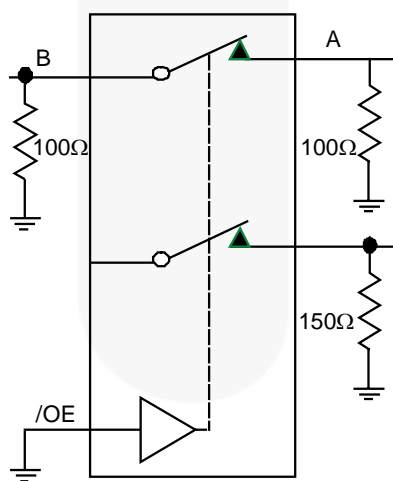


Figure 7. Crosstalk

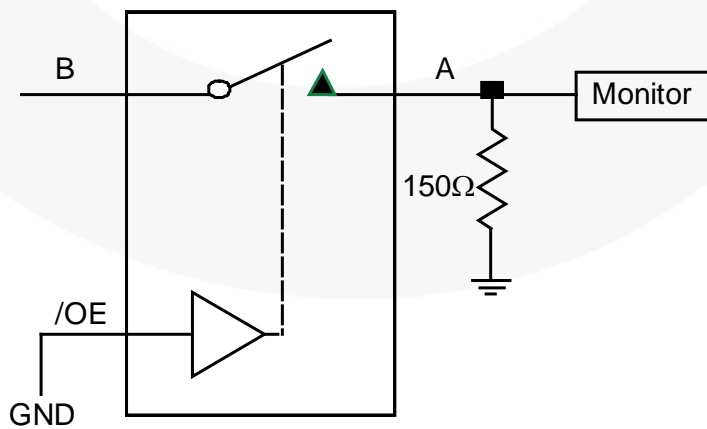
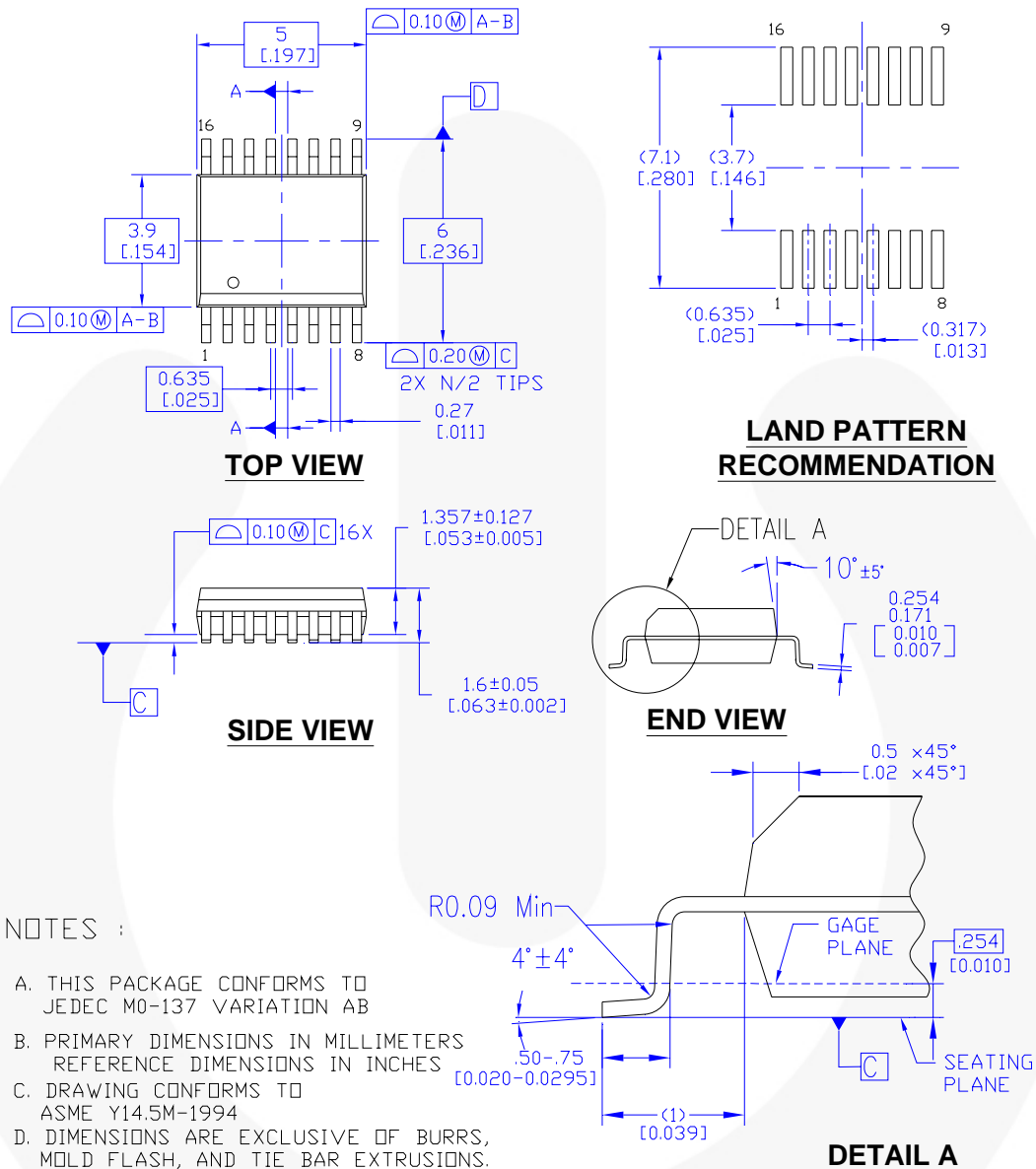


Figure 8. Bandwidth

Physical Dimensions



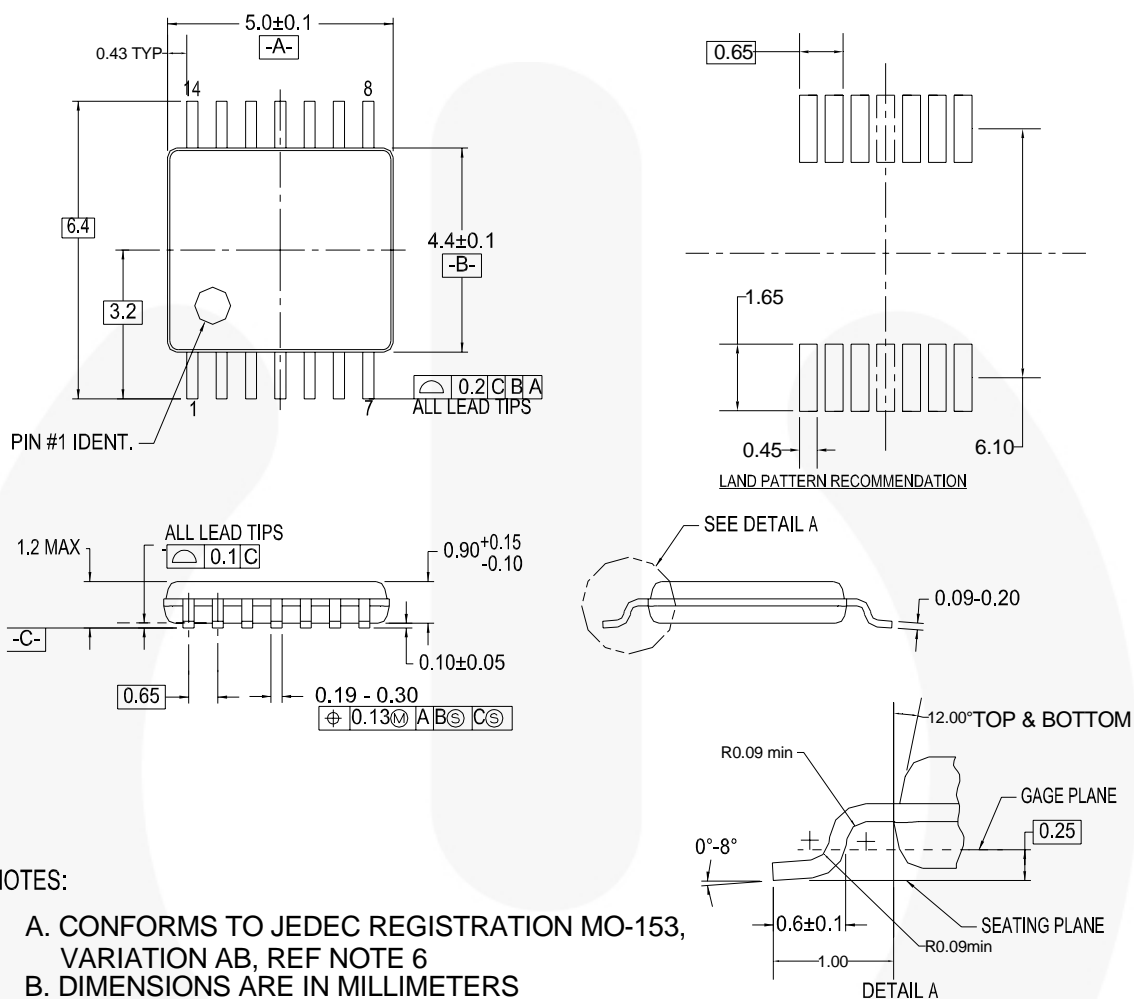
MQA16AREVB

Figure 9. 16-Lead, Quarter Size Outline Package (QSOP), JEDEC MO-137, 0.150-inch 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



NOTES:

- A. CONFORMS TO JEDEC REGISTRATION MO-153, VARIATION AB, REF NOTE 6
- B. DIMENSIONS ARE IN MILLIMETERS
- C. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS
- D. DIMENSIONING AND TOLERANCES PER ANSI Y14.5M, 1982
- E. LANDPATTERN STANDARD: SOP65P640X110-14M
- F. DRAWING FILE NAME: MTC14REV6

Figure 10. 14-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 [®] | FPST [™] | PDP SPM [™] | The Power Franchise [®] |
| Build it Now [™] | F-PFS [™] | Power-SPM [™] |  |
| CorePLUS [™] | FRFET [®] | PowerTrench [®] | TinyBoost [™] |
| CorePOWER [™] | Global Power Resource SM | Programmable Active Droop [™] | TinyBuck [™] |
| CROSSVOLT [™] | Green FPST [™] | QFET [®] | TinyLogic [®] |
| CTL [™] | Green FPST [™] e-Series [™] | QST [™] | TINYOPTO [™] |
| Current Transfer Logic [™] | GTO [™] | Quiet Series [™] | TinyPower [™] |
| EcoSPARK [®] | IntelliMAX [™] | RapidConfigure [™] | TinyPWM [™] |
| EfficientMax [™] | ISOPLANAR [™] | Saving our world, 1mW at a time [™] | TinyWire [™] |
| EZSWITCH [™] * | MegaBuck [™] | SmartMax [™] | μSerDes [™] |
|  | MICROCOUPLER [™] | SMART START [™] |  |
|  | MicroFET [™] | SPM [®] | UHC [®] |
| Fairchild [®] | MicroPak [™] | STEALTH [™] | Ultra FRFET [™] |
| Fairchild Semiconductor [®] | MillerDrive [™] | SuperFET [™] | UniFET [™] |
| FACT Quiet Series [™] | MotionMax [™] | SuperSOT [™] -3 | VCX [™] |
| FACT [®] | Motion-SPM [™] | SuperSOT [™] -6 | VisualMax [™] |
| FAST [®] | OPTOLOGIC [®] | SuperSOT [™] -8 | |
| FastvCore [™] | OPTOPLANAR [®] | SupreMOS [™] | |
| FlashWriter [®] * | | SyncFET [™] | |
| | |  | |

* 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 / 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 is discontinued by Fairchild Semiconductor. The datasheet is for reference information only. |

Rev. 134

Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

-  [View FSAV332MTCX on WIN SOURCE](#)
-  [Fairchild/ON Semiconductor Information](#)

Optimize Your Supply Chain with WIN SOURCE Solutions

-  Global Sourcing Solution
-  Obsolete Management
-  Cost Control Management
-  Shortage Management
-  Alternative Solution
-  Excess Inventory Management