General Purpose 6-Pin Phototransistor Optocouplers

Features
- UL recognized (File # E90700, Volume 2)
- VDE recognized (File # 102497)
  - Add option V (e.g., 4N25VM)

Applications
- Power supply regulators
- Digital logic inputs
- Microprocessor inputs

Description
The general purpose optocouplers consist of a gallium arsenide infrared emitting diode driving a silicon phototransistor in a 6-pin dual in-line package.

Schematic

Package Outlines
# Absolute Maximum Ratings

(T_A = 25°C unless otherwise specified)

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.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Value</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>T_{STG}</td>
<td>Storage Temperature</td>
<td>-40 to +150</td>
<td>°C</td>
</tr>
<tr>
<td>T_{OPR}</td>
<td>Operating Temperature</td>
<td>-40 to +100</td>
<td>°C</td>
</tr>
<tr>
<td>T_{SOL}</td>
<td>Wave solder temperature (see page 8 for reflow solder profile)</td>
<td>260 for 10 sec</td>
<td>°C</td>
</tr>
<tr>
<td>P_{D}</td>
<td>Total Device Power Dissipation @ T_A = 25°C</td>
<td>250</td>
<td>mW</td>
</tr>
<tr>
<td></td>
<td>Derate above 25°C</td>
<td>2.94</td>
<td></td>
</tr>
</tbody>
</table>

## Electrical Characteristics

(T_A = 25°C unless otherwise specified)

### Individual Component Characteristics

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Test Conditions</th>
<th>Min.</th>
<th>Typ.*</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>V_F</td>
<td>Input Forward Voltage</td>
<td>I_F = 10mA</td>
<td>1.18</td>
<td></td>
<td>1.50</td>
<td>V</td>
</tr>
<tr>
<td>V_R</td>
<td>Reverse Leakage Current</td>
<td>V_R = 6.0V</td>
<td>0.001</td>
<td></td>
<td>10</td>
<td>µA</td>
</tr>
</tbody>
</table>

### DETECTOR

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Characteristic</th>
<th>Test Conditions</th>
<th>Min.</th>
<th>Typ.*</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>I_{CEO}</td>
<td>Collector-Emitter Breakdown Voltage</td>
<td>I_C = 1.0mA, I_F = 0</td>
<td>30</td>
<td></td>
<td>100</td>
<td>V</td>
</tr>
<tr>
<td>I_{CBO}</td>
<td>Collector-Base Breakdown Voltage</td>
<td>I_C = 100µA, I_F = 0</td>
<td>70</td>
<td></td>
<td>120</td>
<td>V</td>
</tr>
<tr>
<td>I_{ECO}</td>
<td>Emitter-Collector Breakdown Voltage</td>
<td>I_E = 100µA, I_F = 0</td>
<td>7</td>
<td></td>
<td>10</td>
<td>V</td>
</tr>
</tbody>
</table>

### Isolation Characteristics

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Characteristic</th>
<th>Test Conditions</th>
<th>Min.</th>
<th>Typ.*</th>
<th>Max.</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>V_{ISO}</td>
<td>Input-Output Isolation Voltage</td>
<td>f = 60Hz, t = 1 sec</td>
<td>7500</td>
<td></td>
<td></td>
<td>Vac(pk)</td>
</tr>
<tr>
<td>R_{ISO}</td>
<td>Isolation Resistance</td>
<td>V_{I-O} = 500 VDC</td>
<td>10^{11}</td>
<td></td>
<td></td>
<td>Ω</td>
</tr>
<tr>
<td>C_{ISO}</td>
<td>Isolation Capacitance</td>
<td>V_{I-O} = &amp;, f = 1MHz</td>
<td>0.2</td>
<td></td>
<td>2</td>
<td>pF</td>
</tr>
</tbody>
</table>

*Typical values at T_A = 25°C
### Electrical Characteristics (Continued) \( (T_A = 25°C \text{ unless otherwise specified}) \)

#### Transfer Characteristics

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter Description</th>
<th>Test Conditions</th>
<th>Device</th>
<th>Min.</th>
<th>Typ.*</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTR</td>
<td>Current Transfer Ratio, Collector to Emitter</td>
<td>( I_F = 10mA, V_{CE} = 10V )</td>
<td>4N35M, 4N36M, 4N37M</td>
<td>100</td>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>H11A1M</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>H11A5M</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4N27M, 4N28M, H11A4M</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>( I_F = 10mA, V_{CE} = 10V, T_A = -55°C )</td>
<td>4N35M, 4N36M, 4N37M</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>( I_F = 10mA, V_{CE} = 10V, T_A = +100°C )</td>
<td>4N35M, 4N36M, 4N37M</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>( V_{CE} \text{ (SAT)} )</td>
<td>Saturation Voltage</td>
<td>( I_C = 2mA, I_F = 50mA )</td>
<td>4N25M, 4N26M, 4N27M, 4N28M, 4N35M, 4N36M, 4N37M</td>
<td>0.5</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>( I_C = 0.5mA, I_F = 10mA )</td>
<td>H11A1M, H11A2M, H11A3M, H11A4M, H11A5M</td>
<td>0.3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### AC Characteristics

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter Description</th>
<th>Test Conditions</th>
<th>Device</th>
<th>Min.</th>
<th>Typ.*</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>( T_{ON} )</td>
<td>Non-Saturated Turn-on Time</td>
<td>( I_F = 10mA, V_{CC} = 10V, R_L = 100\Omega \text{ (Fig. 11)} )</td>
<td>4N25M, 4N26M, 4N27M, 4N28M, 4N35M, 4N36M, 4N37M</td>
<td>2</td>
<td>( \mu s )</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>( I_C = 2mA, V_{CC} = 10V, R_L = 100\Omega \text{ (Fig. 11)} )</td>
<td>4N35M, 4N36M, 4N37M</td>
<td>2</td>
<td>10</td>
<td>( \mu s )</td>
<td></td>
</tr>
<tr>
<td>( T_{OFF} )</td>
<td>Turn-off Time</td>
<td>( I_F = 10mA, V_{CC} = 10V, R_L = 100\Omega \text{ (Fig. 11)} )</td>
<td>4N25M, 4N26M, 4N27M, 4N28M, H11A1M, H11A2M, H11A3M, H11A4M, H11A5M</td>
<td>2</td>
<td>( \mu s )</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>( I_C = 2mA, V_{CC} = 10V, R_L = 100\Omega \text{ (Fig. 11)} )</td>
<td>4N35M, 4N36M, 4N37M</td>
<td>2</td>
<td>10</td>
<td>( \mu s )</td>
<td></td>
</tr>
</tbody>
</table>

* Typical values at \( T_A = 25°C \)
Typical Performance Curves

**Fig. 1** LED Forward Voltage vs. Forward Current

<table>
<thead>
<tr>
<th>IF (mA)</th>
<th>Vf (V)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>10</td>
<td>1.5</td>
</tr>
<tr>
<td>50</td>
<td>2.0</td>
</tr>
<tr>
<td>100</td>
<td>2.5</td>
</tr>
</tbody>
</table>

- TA = 25°C
- TA = 55°C
- TA = 100°C

**Fig. 2** Normalized CTR vs. Forward Current

<table>
<thead>
<tr>
<th>IF (mA)</th>
<th>CTR</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0.8</td>
</tr>
<tr>
<td>4</td>
<td>0.6</td>
</tr>
<tr>
<td>6</td>
<td>0.4</td>
</tr>
<tr>
<td>8</td>
<td>0.2</td>
</tr>
</tbody>
</table>

- VCE = 5.0V
- TA = 25°C
- Normalized to IF = 10 mA

**Fig. 3** Normalized CTR vs. Ambient Temperature

<table>
<thead>
<tr>
<th>TA (°C)</th>
<th>CTR</th>
</tr>
</thead>
<tbody>
<tr>
<td>-60</td>
<td>0.2</td>
</tr>
<tr>
<td>-40</td>
<td>0.4</td>
</tr>
<tr>
<td>-20</td>
<td>0.6</td>
</tr>
<tr>
<td>0</td>
<td>0.8</td>
</tr>
<tr>
<td>20</td>
<td>1.0</td>
</tr>
</tbody>
</table>

- IF = 5 mA
- IF = 10 mA
- IF = 20 mA
- Normalized to IF = 10 mA
- TA = 25°C

**Fig. 4** CTR vs. RBE (Unsaturated)

<table>
<thead>
<tr>
<th>RBE (kΩ)</th>
<th>CTR</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>0.2</td>
</tr>
<tr>
<td>100</td>
<td>0.4</td>
</tr>
<tr>
<td>1000</td>
<td>0.6</td>
</tr>
</tbody>
</table>

- VCE = 5.0V
- IF = 20 mA
- IF = 10 mA
- IF = 5 mA

**Fig. 5** CTR vs. RBE (Saturated)

<table>
<thead>
<tr>
<th>RBE (kΩ)</th>
<th>CTR</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>0.1</td>
</tr>
<tr>
<td>100</td>
<td>0.2</td>
</tr>
<tr>
<td>1000</td>
<td>0.3</td>
</tr>
</tbody>
</table>

- IF = 20 mA
- IF = 10 mA
- IF = 5 mA
- VCE = 0.3 V

**Fig. 6** Collector-Emitter Saturation Voltage vs. Collector Current

<table>
<thead>
<tr>
<th>IC (mA)</th>
<th>VCE (V)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1</td>
<td>1.0</td>
</tr>
<tr>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>10</td>
<td>100</td>
</tr>
</tbody>
</table>

- TA = 25°C
- IF = 2.5 mA
- IF = 5 mA
- IF = 10 mA
Typical Performance Curves (Continued)

**Fig. 7** Switching Speed vs. Load Resistor

**Fig. 8** Normalized \( t_{on} \) vs. \( R_{BE} \)

**Fig. 9** Normalized \( t_{off} \) vs. \( R_{BE} \)

**Fig. 10** Dark Current vs. Ambient Temperature

**Fig. 11** Switching Time Test Circuit and Waveforms

Adjust \( I_r \) to produce \( I_c = 2 \text{ mA} \)
4NXXM, H11AXM — General Purpose 6-Pin Phototransistor Optocouplers

Package Dimensions

**Through Hole**

**0.4” Lead Spacing**

**Surface Mount**

**Recommended Pad Layout**

*Note:*
All dimensions in mm.
Ordering Information

<table>
<thead>
<tr>
<th>Option</th>
<th>Order Entry Identifier (Example)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>No option</td>
<td>4N25M</td>
<td>Standard Through Hole Device</td>
</tr>
<tr>
<td>S</td>
<td>4N25SM</td>
<td>Surface Mount Lead Bend</td>
</tr>
<tr>
<td>SR2</td>
<td>4N25SR2M</td>
<td>Surface Mount; Tape and Reel</td>
</tr>
<tr>
<td>T</td>
<td>4N25TM</td>
<td>0.4&quot; Lead Spacing</td>
</tr>
<tr>
<td>V</td>
<td>4N25VM</td>
<td>VDE 0884</td>
</tr>
<tr>
<td>TV</td>
<td>4N25TVM</td>
<td>VDE 0884, 0.4&quot; Lead Spacing</td>
</tr>
<tr>
<td>SV</td>
<td>4N25SVM</td>
<td>VDE 0884, Surface Mount</td>
</tr>
<tr>
<td>SR2V</td>
<td>4N25SR2VM</td>
<td>VDE 0884, Surface Mount, Tape and Reel</td>
</tr>
</tbody>
</table>

Marking Information

Definitions

1. Fairchild logo
2. Device number
3. VDE mark (Note: Only appears on parts ordered with VDE option – See order entry table)
4. One digit year code, e.g., ‘7’
5. Two digit work week ranging from ‘01’ to ‘53’
6. Assembly package code

*Note – Parts that do not have the ‘V’ option (see definition 3 above) that are marked with date code ‘325’ or earlier are marked in portrait format.
Carrier Tape Specification

Reflow Profile

260°C

>245°C = 42 Sec

Time above
183°C = 90 Sec

1.822°C/Sec Ramp up rate

33 Sec

0 60 120 180 270 360

Time (s)

0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300

°C

2.0 ± 0.05

4.0 ± 0.1

12.0 ± 0.1

0.30 ± 0.05

Ø1.5 MIN

1.75 ± 0.10

0.1 MAX

10.1 ± 0.20

Ø1.5 ± 0.1/-0

21.0 ± 0.1

2.0 ± 0.1

11.5 ± 1.0

9.1 ± 0.20

24.0 ± 0.3

202 ± 0.05

4.5 ± 0.20

0.30 ± 0.05

1.5 ± MIN
PRODUCT STATUS DEFINITIONS

**Definition of Terms**

<table>
<thead>
<tr>
<th>Datasheet Identification</th>
<th>Product Status</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Information</td>
<td>Formative / In Design</td>
<td>Datasheet contains the design specifications for product development. Specifications may change in any manner without notice.</td>
</tr>
<tr>
<td>Preliminary</td>
<td>First Production</td>
<td>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.</td>
</tr>
<tr>
<td>No Identification Needed</td>
<td>Full Production</td>
<td>Datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve the design.</td>
</tr>
<tr>
<td>Obsolete</td>
<td>Not In Production</td>
<td>Datasheet contains specifications on a product that is discontinued by Fairchild Semiconductor. The datasheet is for reference information only.</td>
</tr>
</tbody>
</table>

**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:

1. 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.

2. 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.

**ANTI-COUNTERFEITING POLICY**

Fairchild Semiconductor Corporation's Anti-Counterfeiting Policy. Fairchild's Anti-Counterfeiting Policy is also stated on our external website, www.fairchildsemi.com, under Sales Support.

Counterfeiting of semiconductor parts is a growing problem in the industry. All manufacturers of semiconductor products are experiencing counterfeiting of their parts. Customers who inadvertently purchase counterfeit parts experience many problems such as loss of brand reputation, substandard performance, failed applications, and increased cost of production and manufacturing delays. Fairchild is taking strong measures to protect ourselves and our customers from the proliferation of counterfeit parts. Fairchild strongly encourages customers to purchase Fairchild parts either directly from Fairchild or from Authorized Fairchild Distributors who are listed by country on our web page cited above. Products customers buy either from Fairchild directly or from Authorized Fairchild Distributors are genuine parts, have full traceability, meet Fairchild’s quality standards for handling and storage and provide access to Fairchild’s full range of up-to-date technical and product information.

Fairchild and our Authorized Distributors will stand behind all warranties and will appropriately address any warranty issues that may arise. Fairchild will not provide any warranty coverage or other assistance for parts bought from Unauthorized Sources. Fairchild is committed to combat this global problem and encourage our customers to do their part in stopping this practice by buying direct or from authorized distributors.

**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.

Build it Now™
CorePLUS™
CorePOWER™
CROSSVOLT™
CTL™
Current Transfer Logic™
EcoSPARK®
EfficientMax™
EZSWITCH™ *
Fairchild®
FACT Quiet Series™
FACT™
FAS
tCore™
FlashWriter®
FPS™
F-FPS™
FRFET®
Global Power ResourceSM
Green FPS™
Green FPS™ e-Series™
GTO™
IntelliMAX™
ISOPLANAR™
MegaBuck™
MICROCOUPLER™
MicroFET™
MicroPak™
MillerDrive™
MotionMax™
Motion-SPM™
OPTOLOGIC®
OPTOPLANAR®
PDIP SPM™
Power-SPM™
PowerTrench®
PowerXS™
Programmable Active Droop™
QFET®
QS™
Quiet Series™
RapidConfigure™
Saving our world, 1mW/W/kW at a time™
SmartMax™
SMART START™
SPM™
STEALTH™
SuperFET™
SuperSOT™-3
SuperSOT™-6
SuperSOT™-8
SupreMOS™
SyncFET™
System®
The Power Franchise®

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

**EASY SWITCH™ and FlashWriter®** are trademarks of System General Corporation, used under license by Fairchild Semiconductor.

**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.

Build it Now™
CorePLUS™
CorePOWER™
CROSSVOLT™
CTL™
Current Transfer Logic™
EcoSPARK®
EfficientMax™
EZSWITCH™ *
Fairchild®
FACT Quiet Series™
FACT™
FAS
tCore™
FlashWriter®
FPS™
F-FPS™
FRFET®
Global Power ResourceSM
Green FPS™
Green FPS™ e-Series™
GTO™
IntelliMAX™
ISOPLANAR™
MegaBuck™
MICROCOUPLER™
MicroFET™
MicroPak™
MillerDrive™
MotionMax™
Motion-SPM™
OPTOLOGIC®
OPTOPLANAR®
PDIP SPM™
Power-SPM™
PowerTrench®
PowerXS™
Programmable Active Droop™
QFET®
QS™
Quiet Series™
RapidConfigure™
Saving our world, 1mW/W/kW at a time™
SmartMax™
SMART START™
SPM™
STEALTH™
SuperFET™
SuperSOT™-3
SuperSOT™-6
SuperSOT™-8
SupreMOS™
SyncFET™
System®
The Power Franchise®

* 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:

1. 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.

2. 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.

**ANTI-COUNTERFEITING POLICY**

Fairchild Semiconductor Corporation's Anti-Counterfeiting Policy. Fairchild's Anti-Counterfeiting Policy is also stated on our external website, www.fairchildsemi.com, under Sales Support.

Counterfeiting of semiconductor parts is a growing problem in the industry. All manufacturers of semiconductor products are experiencing counterfeiting of their parts. Customers who inadvertently purchase counterfeit parts experience many problems such as loss of brand reputation, substandard performance, failed applications, and increased cost of production and manufacturing delays. Fairchild is taking strong measures to protect ourselves and our customers from the proliferation of counterfeit parts. Fairchild strongly encourages customers to purchase Fairchild parts either directly from Fairchild or from Authorized Fairchild Distributors who are listed by country on our web page cited above. Products customers buy either from Fairchild directly or from Authorized Fairchild Distributors are genuine parts, have full traceability, meet Fairchild’s quality standards for handling and storage and provide access to Fairchild’s full range of up-to-date technical and product information.

Fairchild and our Authorized Distributors will stand behind all warranties and will appropriately address any warranty issues that may arise. Fairchild will not provide any warranty coverage or other assistance for parts bought from Unauthorized Sources. Fairchild is committed to combat this global problem and encourage our customers to do their part in stopping this practice by buying direct or from authorized distributors.

**PRODUCT STATUS DEFINITIONS**

**Definition of Terms**

<table>
<thead>
<tr>
<th>Datasheet Identification</th>
<th>Product Status</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advance Information</td>
<td>Formative / In Design</td>
<td>Datasheet contains the design specifications for product development. Specifications may change in any manner without notice.</td>
</tr>
<tr>
<td>Preliminary</td>
<td>First Production</td>
<td>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.</td>
</tr>
<tr>
<td>No Identification Needed</td>
<td>Full Production</td>
<td>Datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve the design.</td>
</tr>
<tr>
<td>Obsolete</td>
<td>Not In Production</td>
<td>Datasheet contains specifications on a product that is discontinued by Fairchild Semiconductor. The datasheet is for reference information only.</td>
</tr>
</tbody>
</table>