



File E90700

Vol 2

Issued: 1998-11-17

Revised: 2009-06-26

FOLLOW-UP SERVICE PROCEDURE
(TYPE R)

COMPONENT - OPTICAL ISOLATORS
(FPQU2,FPQU8)

Manufacturer: LITE-ON ELECTRONICS (THAILAND) CO LTD
(153559-001) 38/4 MOO 1 RANGSIT-ONGKARAK RD
BUNGYEETOH
TANYABURI
PHATHUM THANI 12130 THAILAND

Applicant: FAIRCHILD SEMICONDUCTOR CORP
(725625-001) 3001 ORCHARD PKY
SAN JOSE CA 95134

Recognized Company: SAME AS APPLICANT
(725625-001)

This Procedure authorizes the above manufacturer to use the marking specified by Underwriters Laboratories Inc.(UL), or any authorized licensee of UL, only on products covered by this Procedure, in accordance with the applicable UL Services Agreement.

The prescribed Mark or Marking shall be used only at the above manufacturing location on such products which comply with this Procedure and any other applicable requirements.

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Underwriters Laboratories Inc.

Stephen Hewson
Senior Vice President
Global Follow-Up Service Operations

William R. Carney
Director
North American Certification Program

Recognized Component Marking Data Page (RCMDP)

(FILE IMMEDIATELY AFTER AUTHORIZATION PAGE)

RECOGNIZED COMPONENT MARKING

Products Recognized under UL's Component Recognition Service are identified by marking elements consisting of:

1. The Recognized Company's identification specified in this document.
2. A catalog, model or other applicable product designation specified in the descriptive sections of this document.
3. The UL Recognized Component Mark shown below is optional unless required elsewhere in the Procedure.

Only those components, which actually bear the Marking, should be considered as being covered under the Recognition Program. The UL Listing or Classification Mark is not authorized for use on or in connection with Recognized Components.

Recognized Component Mark



Minimum size of the Recognized Component Mark is not specified as long as it is legible. Minimum height of the registered symbol ® shall be 3/64 inch but may be omitted if it is out of proportion to the Recognized Component Mark or not legible to the naked eye.

The manufacturer may reproduce the Mark electronically. Any decision regarding the acceptability of the manufacturer's Mark reproduction will be made at the Reviewing Office.

Recognized Component Marking Data Page (RCMDP)

(FILE IMMEDIATELY AFTER AUTHORIZATION PAGE)

RECOGNIZED COMPONENT MARKING

Products Recognized under UL's Component Recognition Service are identified by marking elements consisting of:

1. The Recognized Company's identification specified in this document.
2. A catalog, model or other applicable product designation specified in the descriptive sections of this document.
3. The UL Recognized Component Mark shown below:
 - (A) Recognized only to Canadian safety requirements, or;
 - (B) Recognized to both U.S. and Canadian safety requirements.

Only those components, which actually bear the Marking, should be considered as being covered under the Recognition Program. The UL Listing or Classification Mark is not authorized for use on or in connection with Recognized Components.

Recognized Component Mark

(A)



(B)



Minimum size of the Recognized Component Mark is not specified as long as it is legible. Minimum height of the registered symbol ® shall be 3/64 inch but may be omitted if it is out of proportion to the Recognized Component Mark or not legible to the naked eye.

The manufacturer may reproduce the Mark electronically. Any decision regarding the acceptability of the manufacturer's Mark reproduction will be made at the Reviewing Office.

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| Cat. No | Section | Report Date |
|---|---------|-------------|
| <p>Optical Isolators, Package Construction Code S, Eight-pin devices, Type FOD27X2Y, HCPL-05XX, HCPL-04XX, HCPL-07XX, HCPL-06XX, MOCXX, MOC2XX, MOC2XX, FOD050L, FOD053L, HCPL-0530, HCPL-0531, HCPL-0534, HCPL-0453, FOD070L, FOD073L, HCPL-0730, HCPL-0731, FOD0708, FOD0738, FOD0708L, FOD0738L, HCPL0611, HCPL0630, HCPL0631, HCPL0661, FOD060L, FOD063L, FOD061A, FOD061N, FOD063A, FOD063N, FOD061AL, FOD061NL, FOD063AL, FOD063NL, FOD0710, FOD0720, FOD072L, FOD0721 and FOD8001.</p> <p>Optical Isolators, Package Construction Code S1, Eight-pin devices, Type FOD0708, FOD0738, FOD0708L, FOD0738L, HCPL0611, HCPL0630, HCPL0631, HCPL0661, FOD060L, FOD063L, FOD061A, FOD061N, FOD063A, FOD063N, FOD061AL, FOD061NL, FOD063AL, FOD063NL, FOD0710, FOD0720, FOD072L, FOD0721 and FOD8001.</p> | 5 | 08-07-02 |
| Optical Isolator, Type FODB1XX, where XX can be any two numerical digits from 00 to 99. | 6 | 2004-07-20 |
| USR - Single Protection Optical Isolator, Model KOI00003, may be followed by any number or letter. | 7 | 2005-09-06 |
| Withdrawn | 8 | 2007-01-05 |

GENERAL


PRODUCT COVERED:

Component-Optical Isolators.

*

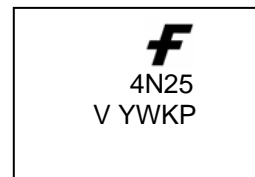
MARKING:

USR - Recognized company name or trademark, and model designation provided on each unit.

CNR - Recognized company name or trademark, model designation, and the Recognized Component Mark for Canada , provided on each unit.


*

F - Denotes Company Trademark.
 4N25 - Denotes Designation Type.
 V - Denotes VDE Approved Part.
 XY - Denotes One or Two Digit Year Code.
 WK - Denotes Two Digit Week Code.
 P - Denotes Package Code.



Note: The space between the V and the Y may vary.

TRADE NAME/TRADEMARK:

The following trade name or trademark, "Q" or "QTC" or , if any, may be used in lieu of the company name to identify Recognized Components covered by this procedure.

Note: Company Trademark can be located Above or Before the "Designation Type".

RATINGS:

Specification Sheet - A specification sheet shall be provided with the product and contain the following information in tabular or graphic format:

1. Maximum continuous power, a current, and voltage rating for both the photo-emitter and the photo-sensor circuits.
2. A dielectric isolation-voltage rating between input and output terminals, specified in volts rms, or dc, as applicable.
3. The maximum operating temperature.
4. Derating specifications related to ambient temperatures.

GENERAL CONSTRUCTION:

Corrosion Protection - All ferrous parts are of corrosion resistant material or are plated or painted as corrosion protection.

File E90700
Project 98SC45471

November 17, 1998

REPORT
ON
COMPONENT - OPTICAL ISOLATORS

QT Optoelectronics
Sunnyvale, California

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DESCRIPTION

PRODUCT COVERED:

Component - Optical Isolators, Construction Code "Q", six-pin devices. Types H74C1, H74C2, MCA230, MCA231, MCA255, MCS2, MCS2400, MCT2, MCT2E, MCT26, MCT210, MCT271 through MCT275, MCT277, SOI-8, 107P10139, 107P10124, 374-0135, 385-0002, 480-1 through 480-4, 480-6, 162-18-0 through -8, 162-19-0 through -8, 326802, 335522, 404325, 1853010MTE, 12852153, 0355L1. Types 01S63, 01S63A, 01S67, 01S67A, TLP531, TLP532. Types 4N, CNX, CNY, H11, IL, MC, OPI, SCS, SOC, TIL, followed by up to five letters or numbers; Type MOC, followed by any number except 2, followed by up to four letters or numbers.

GENERAL:

This device is a photo-coupled isolator consisting of a photo-emitter such as a light emitting diode, optically coupled to a photo detector such as a transistor. They are intended to be used in applications where the suitability of the combination has been determined by Underwriters Laboratories Inc. Only the insulation function for the rated dielectric insulation voltage between the input and output of the device has been investigated.

RATINGS:

| Electrical Ratings for "Q" Package | | | | | |
|------------------------------------|-------------|----------------|-------------------------------|---|-------------------------|
| Diode Current | Diode Power | Detector Power | Dielectric Voltage (V ac rms) | Double Protection Isolation Rating (V ac rms) | Max Operating Temp (°C) |
| 80 mA | 150 mW | 150 mW | 4170 | 3500 | 100 |

ENGINEERING CONSIDERATIONS (NOT FOR FIELD REPRESENTATIVE'S USE):

These devices are optically coupled isolating switches with gallium arsenide light emitting diodes optically coupled to photo detectors. The solid state portion of these devices is encapsulated in a silicon or epoxy compound. The light emitting diode and detector are separated by an insulating window. Internal "chips" are provided with terminals molded into the enclosure.

Use - For use only in products where the acceptability of the combination is determined by Underwriters Laboratories Inc.

Conditions of Acceptability - Each device shall be reviewed with respect to the following conditions of acceptability:

1. The short circuit interrupting capacity, or behavior under short circuit conditions, has not been evaluated for these devices. Accordingly, the end-use circuit should contain suitable impedance to eliminate the end for such testing, or appropriate tests should be conducted.
2. The device shall be installed in compliance with the enclosure, mounting, spacings, and segregation requirements of the ultimate application. No spacings are specified for the device.
3. The outer surface temperature ratings recorded above shall be acceptable in the ultimate application.
4. The suitability of use when exposed to oil, chemicals and the like has not been determined by this investigation.
5. The suitability of the connections shall be determined in the end-use application.
6. The capability of the device to control a load has not been investigated.
7. The suitability of the device to be mounted over dead metal or metal of opposite polarity has not been investigated.
8. These devices are intended for factory wiring only.
9. **For single protection devices, the insulation to the case has not been evaluated. For double protection devices, the insulation to the case has been evaluated to the isolation voltage specified in the ratings table.**
10. **In addition to meeting single protection requirements, double protection optical isolators have also been investigated for use in up to 250 V, 50/60 Hz circuits in audio, video, and similar equipment in applications in which breakdown of the optical isolator may result in a risk of fire, electrical shock, or injury to persons.**

CONSTRUCTION DETAILS:

The product shall be constructed in accordance with the following description.

All dimensions are approximate unless specified as "max" or "min".

The general design, shape and arrangement shall be as illustrated, except where variations are specifically described.

Corrosion Protection - All ferrous parts are of corrosion resistant material or are plated or painted as corrosion protection.

Markings - Each device or the smallest shipping carton in which the device was shipped is marked with the company's name or "QTC" or "Q" or

F above or before a 3 or 4 digit type designation. Below the type designation, there is a 3 or 4 digit date code which may be preceded by the factory code, see Sec. Gen., and is followed by a "Q" for the construction system.

File E90700
Project 01SC02681

April 13, 2001

REPORT

ON

COMPONENT - OPTICAL ISOLATORS

Fairchild Semiconductor Corp.
San Jose, California

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DESCRIPTION

PRODUCT COVERED:

USR - Single Protection Optical Isolators, Package Construction Codes M and M1, four-pin devices, FODMRPXX family.

*

GENERAL:

This device is a photocoupled isolator consisting of a photo-emitter such as a light emitting diode, optically coupled to a photo detector such as a transistor. They are intended to be used in applications where the suitability of the combination has been determined by Underwriters Laboratories Inc. Only the insulation function for the rated dielectric insulation voltage between the input and output of the device has been investigated.

Use - For use only in products where the acceptability of the combination is determined by Underwriters Laboratories Inc.

Ratings:

| Package Code | Current (mA) | | Power (mW) | | Isolation Voltage | Max Operating | Max Junction |
|--------------|--------------|----------|------------|----------|-------------------|-----------------|-----------------|
| | Diode | Detector | Diode | Detector | | Temperature (C) | Temperature (C) |
| M | 50 | 80 | 70 | 150 | 3750 | 100 | 125 |
| M1 | 50 | 50 | 60 | 150 | 2500 | 100 | 125 |

| Device Type Designation Package code M | Current (mA) | | Power (mW) | | Isolation Voltage | Max Operating | Max Junction |
|---|--------------|----------|------------|----------|-------------------|----------------|----------------|
| | Diode | Detector | Diode | Detector | | Temperature °C | Temperature °C |
| FODMRPXX Family: FODM3010 FODM3011 FODM3012 FODM3020 FODM3021 FODM3022 FODM3023 FODM3051 FODM3052 FODM3053 | 60 | 70 | 100 | 300 | 3750 | 100 | 125 |

*

See table below for models covered under each package code.

| Package Code | Device Type Number |
|--------------|--|
| M | HMA121#, HMA124#, HMA2701#, HMAA2705#, FODM452, FODM453 |
| M1 | HMHA2801#, HMHA281#, HMHAA280# |

- May be followed by a letter from A to Z

ENGINEERING CONSIDERATIONS (NOT FOR FIELD REPRESENTATIVE'S USE):

These devices are optically coupled isolating switches with light emitting diodes optically coupled to photo detectors. The solid state portion of these devices is encapsulated in a silicon or epoxy compound. The light emitting diode and detector are separated by an insulating window. Internal "chips" are provided with terminals molded into the enclosure.

Conditions of Acceptability - Each device shall be reviewed with respect to the following conditions of acceptability:

1. **The capability of the device to control a load has not been investigated.**
2. **These devices should be installed in a suitable end product enclosure.**
3. **The maximum temperature on the case should not exceed the maximum operating temperature rating specified in the ratings table.**
4. **For single protection devices, the insulation to the case has not been evaluated. For double protection devices, the insulation to the case has been evaluated to the isolation voltage specified in the ratings table.**
5. **In addition to meeting single protection requirements, double protection optical isolators have also been investigated for use in up to 250 V, 50/60 Hz circuits in audio, video, and similar equipment in applications in which breakdown of the optical isolator may result in a risk of fire, electrical shock, or injury to persons.**

CONSTRUCTION DETAILS:

General - The product shall be constructed in accordance with the following description. All dimensions are approximate unless specified as "max" or "min".

The general design, shape and arrangement shall be as illustrated, except where variations are specifically described.

Corrosion Protection - All ferrous parts are of corrosion resistant material or are plated or painted as corrosion protection.

Markings - See Section General for Markings.

*

Model Differences - All models have identical insulation systems. The only difference is the leadframe design or the size of the IC devices.

Abbreviation - R/C - Recognized Component

Pin Connections - See ILLS. 4 and 4A for details.

Package Dimensions - See ILLS. 5 and 5A for details.

Leadframe Design - See ILLS. 3, 3A, 6, 6A, 7, 8, 8A, 9, 10, 11, and 12,
for details.

For Engineering use only.

File E90700
Project 01SC13002

January 31, 2002

REPORT
ON
COMPONENT - OPTICAL ISOLATORS

Fairchild Semiconductor Corp.
San Jose, California

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DESCRIPTION

PRODUCT COVERED:

Component - Optical Isolators, Construction Code A, six-pin devices.

RATINGS:

| <u>Package Code</u> | <u>Current, mA</u> | | <u>Power, mW</u> | | <u>Isolation</u> | <u>Junction</u> | <u>Maximum</u> |
|---------------------|--------------------|-----------------------|------------------|-----------------|---------------------|------------------|----------------------------|
| | <u>Diode</u> | <u>Detector ac/dc</u> | <u>Diode</u> | <u>Detector</u> | <u>Voltage (ac)</u> | <u>Temp., °C</u> | <u>Operating Temp., °C</u> |
| A | 80 | 190/320 | 150 | 375 | 4170 | 125 | 100 |

ENGINEERING CONSIDERATIONS (NOT FOR FIELD REPRESENTATIVE'S USE):

These devices are optically coupled isolating switches with gallium arsenide light emitting diodes optically coupled to photo detectors. The solid state portion of these devices is encapsulated in a silicon or epoxy compound. The light emitting diode and detector are separated by an insulating window. Internal "chips" are provided with terminals molded into the enclosure.

Use - For use only in products where the acceptability of the combination is determined by Underwriters Laboratories Inc.

CONDITIONS OF ACCEPTABILITY -

Each device shall be reviewed with respect to the following conditions of acceptability:

1. The short circuit interrupting capacity or behavior under short circuit conditions has not been evaluated for these devices. Accordingly, the end-use circuit should contain suitable impedance to eliminate the need for such testing or appropriate tests should be conducted.
2. The device shall be installed in compliance with the enclosure, mounting, spacings and segregation requirements of the ultimate application. No spacings are specified for the device.
3. The suitability of use when exposed to oil, chemicals and the like has not been determined by this investigation.
4. The electrical and outer surface temperature ratings shall be acceptable in the ultimate application.
5. The suitability of the connections shall be determined in the end-use application.

CONDITIONS OF ACCEPTABILITY - (Cont'd)

6. The capability of the device to control a load has not been investigated.
7. The suitability of the device to be mounted over dead metal or metal of opposite polarity has not been investigated.
8. These devices are intended for factory wiring only.

CONSTRUCTION DETAILS:

General - The general design, shape and arrangement shall be as illustrated in the following descriptive pages and illustrations. All dimensions are approximate.

* Markings - See Section General for Markings.

Specification Sheet - Specification sheet shall be available at the manufacturing facility and shall contain the following information in tabular or graphic format:

1. Maximum continuous power, a current and a voltage rating for both the photo-emitter and the photo-detector.
2. A dielectric insulation-voltage rating between input and output terminals. This should be the same as the isolation V ac in the ratings above.
3. The maximum operating temperature of the device case.
4. Derating specification related to ambient temperatures.

Model Differences - All models have identical insulation systems. The only difference is the leadframe design or the size of the IC devices.

Abbreviation - R/C = Recognized Component.

Model Numbers and Ratings - See Table A for models covered under package Code A.

Pin Connections - See ILL. 1 for details.

Package Dimensions - See ILL. 2 for details.

TABLE A
MODELS UNDER PACKAGE CODE A

*

| Model No. | Current, mA | | Power, mW | | Isolation Voltage (ac) | Junction Temperature °C | Maximum Operating Temp. °C |
|-----------|-------------|-------------------|-----------|----------|---------------------------|-------------------------------|----------------------------------|
| | Diode | Detector Ac/Dc | Diode | Detector | | | |
| HSR312 | 80 | 190/320 | 150 | 375 | 4170 | 125 | 100 |
| HSR312L | 80 | 170/300 | 150 | 375 | 4170 | 125 | 100 |
| HSR412 | 80 | 140/210 | 150 | 375 | 4170 | 125 | 100 |
| HSR412L | 80 | 120/200 | 150 | 375 | 4170 | 125 | 100 |
| FOD1518AN | 80 | 190/320 | 150 | 550 | 4170 | 125 | 100 |
| FOD1518A | 80 | 170/300 | 150 | 550 | 4170 | 125 | 100 |
| FOD1540AN | 80 | 140/270 | 150 | 550 | 4170 | 125 | 100 |
| FOD1540A | 80 | 120/250 | 150 | 550 | 4170 | 125 | 100 |

* Note: Models HSR312, HRS312L, HSR412 and HSR412L, shown in Fig. 1, ILLs. 1 and 2, correspond to Models FOD1518AN, FOD1518A, FOD1540AN and FOD1540A respectively.

File E90700
Project 02SC04973

April 17, 2002

REPORT
ON
COMPONENT - OPTICAL ISOLATORS

Fairchild Semiconductor Corp.
San Jose, California

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DESCRIPTION

PRODUCT COVERED:

USR, CNR Component - Double Protection Optical Isolators, Construction Code "B", eight-pin devices, Models as shown in the Ratings table.

USR, CNR - Single Protection Optical Isolator, Construction Code "B", **Models** FOD318X, where X may be any number or letter, **FOD3120 and FOD3150.**

RATINGS:

| Model No. | Current, mA | | Power, mW | | Isolation Voltage (V Ac Rms) | Junction Temp. °C | Max Operating Temp. °C |
|-----------|-------------|----------|-----------|----------|------------------------------|-------------------|------------------------|
| | Diode | Detector | Diode | Detector | | | |
| FOD2711 | 20 | 50 | 145 | 85 | 5000 | 125 | 100 |
| FOD2721A | 20 | 50 | 145 | 85 | 5000 | 125 | 100 |
| FOD2721B | 20 | 50 | 145 | 85 | 5000 | 125 | 100 |
| FOD2721C | 20 | 50 | 145 | 85 | 5000 | 125 | 100 |
| FOD2721D | 20 | 50 | 145 | 85 | 5000 | 125 | 100 |
| FOD2741A | 20 | 50 | 145 | 85 | 5000 | 125 | 100 |
| FOD2741B | 20 | 50 | 145 | 85 | 5000 | 125 | 100 |
| FOD2741C | 20 | 50 | 145 | 85 | 5000 | 125 | 100 |
| FOD2741D | 20 | 50 | 145 | 85 | 5000 | 125 | 100 |
| FOD250L | 25 | 8 | 45 | 100 | 5000 | 125 | 100 |
| FOD270L | 25 | 60 | 45 | 100 | 5000 | 125 | 100 |
| 6N135 | 25 | 8 | 45 | 100 | 5000 | 125 | 100 |
| 6N136 | 25 | 8 | 45 | 100 | 5000 | 125 | 100 |
| HCPL-2501 | 25 | 8 | 45 | 100 | 5000 | 125 | 100 |
| HCPL-2502 | 25 | 8 | 45 | 100 | 5000 | 125 | 100 |
| HCPL-2503 | 25 | 8 | 45 | 100 | 5000 | 125 | 100 |
| HCPL-4502 | 25 | 8 | 45 | 100 | 5000 | 125 | 100 |
| HCPL-4503 | 25 | 8 | 45 | 100 | 5000 | 125 | 100 |
| 6N138 | 25 | 60 | 45 | 100 | 5000 | 125 | 100 |
| 6N139 | 25 | 60 | 45 | 100 | 5000 | 125 | 100 |
| FOD2743A | 20 | 50 | 145 | 85 | 5000 | 125 | 100 |
| FOD2743B | 20 | 50 | 145 | 85 | 5000 | 125 | 100 |
| FOD2743C | 20 | 50 | 145 | 85 | 5000 | 125 | 100 |
| FOD2200 | 10 | 25 | 45 | 150 | 5000 | 125 | 85 |
| FOD2219 | 10 | 25 | 45 | 150 | 5000 | 125 | 85 |
| FOD2708 | 20 | 2 | 40 | 85 | 5000 | 125 | 100 |
| 6N137M | 20 | 50 | 40 | 85 | 5000 | 125 | 100 |
| HCPL2601M | 20 | 50 | 40 | 85 | 5000 | 125 | 100 |
| HCPL2611M | 20 | 50 | 40 | 85 | 5000 | 125 | 100 |
| FOD261N | 20 | 50 | 40 | 85 | 5000 | 125 | 100 |
| FOD261A | 20 | 50 | 40 | 85 | 5000 | 125 | 100 |
| FOD260L | 20 | 50 | 40 | 85 | 5000 | 125 | 100 |
| FOD261NL | 20 | 50 | 40 | 85 | 5000 | 125 | 100 |
| FOD261AL | 20 | 50 | 40 | 85 | 5000 | 125 | 100 |

| Model | Current (mA) | | Power (mW) | | Max. Transfer Speed | Isolation Voltage (AC) | Max Operating Temp (°C) | Max Junction Temp(°C) | Max Storage Temp(°C) |
|----------------|--------------|-------------|------------|------------|---------------------------|------------------------------|-------------------------------|-----------------------------|----------------------------|
| | Emitter | Sensor | Emitter | Sensor | | | | | |
| FOD3120 | 25 | 2500 | 45 | 250 | 100 KHz | 5000 | 100 | 125 | 125 |
| FOD3150 | 25 | 800 | 45 | 250 | 100 KHz | 5000 | 100 | 125 | 125 |
| FOD318X | 25 | 2500 | 45 | 250 | 250 KHz | 5000 | 100 | 125 | 125 |

ENGINEERING CONSIDERATIONS (NOT FOR FIELD REPRESENTATIVE'S USE):

These devices are optically coupled isolating switches consisting of a photo-emitter such as light emitting diodes optically coupled to photo detectors such as transistors. The solid state portion of these devices is encapsulated in a silicone or epoxy compound. The light emitting diode and detector are separated by an insulating window. Internal "chips" are provided with terminals molded into the enclosure. Only the insulation function for the rated Dielectric Insulation Voltage between the input and output of the device has been investigated.

* Use - For use only in products where the acceptability of the combination is determined by Underwriters Laboratories Inc.

USR indicates that the optical isolators have been evaluated to the US Standard for Optical Isolators, UL 1577, 4th Edition.

CNR indicates that the optical isolators have been evaluated to the Canadian Standard for Optical Isolators, Component Acceptance Service No. 5A.

Conditions of Acceptability - Each device shall be reviewed with respect to the following conditions of acceptability:

1. **The capability of the device to control a load has not been investigated.**
2. **These devices should be installed in a suitable end product enclosure.**
3. **The maximum temperature on the case should not exceed the maximum operating temperature rating specified in the ratings table.**
4. **For single protection devices, the insulation to the case has not been evaluated. For double protection devices, the insulation to the case has been evaluated to the isolation voltage specified in the ratings table.**
5. **In addition to meeting single protection requirements, double protection optical isolators have also been investigated for use in up to 250 V, 50/60 Hz circuits in audio, video, and similar equipment in applications in which breakdown of the optical isolator may result in a risk of fire, electrical shock, or injury to persons.**

*

CONSTRUCTION DETAILS:

General - The general design, shape and arrangement shall be as illustrated in the following descriptive pages and illustrations. All dimensions are approximate, unless specified as "maximum" or "minimum."

Corrosion Protection - All ferrous parts are of corrosion resistant material or are plated or painted as corrosion protection.

Markings - - Each component is marked with the company's name or "Q" or **f**, above or before the type designation. The package code will be specified after a four-digit date code. See the nomenclature below for more details. Markings may appear on the smallest shipping container.

Example device marking:

f
250L
VYYXXB

Nomenclature:

f or Q denotes Company logo.

2712: Denotes device type. The '250L' is the marking for the FOD250L device. The prefix 'FOD' will be ignored in the device marking.

YYXX: Denotes Date code,
where YY = Two digit year code, Example: 03 indicates year 2003.
XX = Two digit work week code

B: Denotes Package Code B

V: Optional - Denotes VDE 0884 approval mark

Specification Sheet - Specification sheet shall be available at the manufacturing facility and shall contain the following information in tabular or graphic format:

1. Maximum continuous power, a current and a voltage rating for both the photo-emitter and the photo-detector.
2. A dielectric insulation-voltage rating between input and output terminals. This should be the same as the isolation V ac in the ratings above.
3. The maximum operating temperature of the device case.
4. Derating specification related to ambient temperatures.

Model Differences - All models have identical insulation systems. The only difference is the leadframe design or the size of the IC devices. Models FOD2743A/B/C are identical to models FOD2741A/B/C except the orientation of the die inside the package is reversed.

Abbreviation - R/C = Recognized Component.

Pin Connections - See ILL. 1 for details.

Package Dimensions - See ILLS. 2, 3 and 4 for details.

Model FOD318X is identical to Model FOD2711 except for the leadframe design or the size of the IC devices.

File E90700
Project 02SC09316

August 7, 2002

REPORT

ON

COMPONENT - OPTICAL ISOLATORS

Fairchild Semiconductor Corp.
San Jose, California

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DESCRIPTION

PRODUCT COVERED:

USR Component - Optical Isolators, Construction Code S and S1, eight-pin devices, Models as shown in the ratings Table.

RATINGS:

MODELS UNDER PACKAGE CODE S

| Model No. | EMITTER | | DETECTOR | | Isolation Voltage (V ac rms) | Junction Temp °C | Maximum Operating Temp. °C |
|-----------|--------------|------------|--------------|------------|---------------------------------|---------------------|----------------------------|
| | Current (mA) | Power (mW) | Current (mA) | Power (mW) | | | |
| FOD27X2Y | 20 | 145 | 50 | 85 | 2500 | 125 | 125 |
| HCPL-05XX | 50 | 45 | 16 | 100 | 2500 | 125 | 125 |
| HCPL-04XX | 50 | 45 | 16 | 100 | 2500 | 125 | 125 |
| HCPL-07XX | 40 | 35 | 60 | 100 | 2500 | 125 | 125 |
| HCPL-06XX | 20 | 20 | 50 | 85 | 2500 | 125 | 125 |
| MOC2XX | 60 | 90 | 150 | 150 | 2500 | 125 | 125 |
| MOC2XX | 60 | 90 | 150 | 150 | 2500 | 125 | 125 |
| FOD050L | 25 | 45 | 8 | 100 | 2500 | 125 | 100 |
| FOD053L | 25 | 45 | 8 | 100 | 2500 | 125 | 100 |
| HCPL-0530 | 25 | 45 | 8 | 100 | 2500 | 125 | 100 |
| HCPL-0531 | 25 | 45 | 8 | 100 | 2500 | 125 | 100 |
| HCPL-0534 | 25 | 45 | 8 | 100 | 2500 | 125 | 100 |
| HCPL-0453 | 25 | 45 | 8 | 100 | 2500 | 125 | 100 |
| FOD070L | 25 | 45 | 60 | 100 | 2500 | 125 | 100 |
| FOD073L | 25 | 45 | 60 | 100 | 2500 | 125 | 100 |
| HCPL-0730 | 25 | 45 | 60 | 100 | 2500 | 125 | 100 |
| HCPL-0731 | 25 | 45 | 60 | 100 | 2500 | 125 | 100 |
| FOD0708 | 20 | 2 | 40 | 85 | 2500 | 125 | 100 |
| FOD0708L | 20 | 2 | 40 | 85 | 2500 | 125 | 100 |
| FOD0738 | 20 | 2 | 40 | 65 | 2500 | 125 | 100 |
| FOD0738L | 20 | 2 | 40 | 65 | 2500 | 125 | 100 |
| HCPL0611 | 20 | 50 | 40 | 85 | 2500 | 125 | 100 |
| FOD061N | 20 | 50 | 40 | 85 | 2500 | 125 | 100 |
| FOD061A | 20 | 50 | 40 | 85 | 2500 | 125 | 100 |
| FOD060L | 20 | 50 | 40 | 85 | 2500 | 125 | 100 |
| FOD061NL | 20 | 50 | 40 | 85 | 2500 | 125 | 100 |
| FOD061AL | 20 | 50 | 40 | 85 | 2500 | 125 | 100 |
| HCPL0630 | 20 | 50 | 40 | 65 | 2500 | 125 | 100 |
| HCPL-0631 | 20 | 50 | 40 | 65 | 2500 | 125 | 100 |
| HCPL-0661 | 20 | 50 | 40 | 65 | 2500 | 125 | 100 |
| FOD063N | 20 | 50 | 40 | 65 | 2500 | 125 | 100 |
| FOD063A | 20 | 50 | 40 | 65 | 2500 | 125 | 100 |

MODELS UNDER PACKAGE CODE S

| Model No. | EMITTER | | DETECTOR | | Isolation Voltage (V ac rms) | Junction Temp °C | Maximum Operating Temp. °C |
|-----------|--------------|------------|--------------|------------|---------------------------------|---------------------|----------------------------|
| | Current (mA) | Power (mW) | Current (mA) | Power (mW) | | | |
| FOD063L | 20 | 50 | 40 | 65 | 2500 | 125 | 100 |
| FOD063NL | 20 | 50 | 40 | 65 | 2500 | 125 | 100 |
| FOD063AL | 20 | 50 | 40 | 65 | 2500 | 125 | 100 |
| FOD0710 | 10 | 116.7 | 10 | 116.7 | 2500 | 125 | 100 |
| FOD0720 | 10 | 116.7 | 10 | 116.7 | 2500 | 125 | 100 |
| FOD0721 | 10 | 116.7 | 10 | 116.7 | 2500 | 125 | 100 |
| FOD072L | 10 | 115.0 | 9.0 | 115.0 | 2500 | 125 | 105 |
| FOD8001 | 10 | 115.0 | 9.0 | 115.0 | 2500 | 125 | 105 |

Note: X may be any number, Y may be A, B, C or D

MODELS UNDER PACKAGE CODE S1

| Model No. | EMITTER | | DETECTOR | | Isolation Voltage (V ac rms) | Junction Temp °C | Maximum Operating Temp. °C |
|-----------|--------------|------------|--------------|------------|---------------------------------|---------------------|----------------------------|
| | Current (mA) | Power (mW) | Current (mA) | Power (mW) | | | |
| FOD0708 | 20 | 2 | 40 | 85 | 3750 | 125 | 100 |
| FOD0708L | 20 | 2 | 40 | 85 | 3750 | 125 | 100 |
| FOD0738 | 20 | 2 | 40 | 65 | 3750 | 125 | 100 |
| FOD0738L | 20 | 2 | 40 | 65 | 3750 | 125 | 100 |
| HCPL0611 | 20 | 50 | 40 | 85 | 3750 | 125 | 100 |
| FOD061N | 20 | 50 | 40 | 85 | 3750 | 125 | 100 |
| FOD061A | 20 | 50 | 40 | 85 | 3750 | 125 | 100 |
| FOD060L | 20 | 50 | 40 | 85 | 3750 | 125 | 100 |
| FOD061NL | 20 | 50 | 40 | 85 | 3750 | 125 | 100 |
| FOD061AL | 20 | 50 | 40 | 85 | 3750 | 125 | 100 |
| HCPL0630 | 20 | 50 | 40 | 65 | 3750 | 125 | 100 |
| HCPL-0631 | 20 | 50 | 40 | 65 | 3750 | 125 | 100 |
| HCPL-0661 | 20 | 50 | 40 | 65 | 3750 | 125 | 100 |
| FOD063N | 20 | 50 | 40 | 65 | 3750 | 125 | 100 |
| FOD063A | 20 | 50 | 40 | 65 | 3750 | 125 | 100 |
| FOD063L | 20 | 50 | 40 | 65 | 3750 | 125 | 100 |
| FOD063NL | 20 | 50 | 40 | 65 | 3750 | 125 | 100 |
| FOD063AL | 20 | 50 | 40 | 65 | 3750 | 125 | 100 |
| FOD0710 | 10 | 116.7 | 10 | 116.7 | 3750 | 125 | 100 |
| FOD0720 | 10 | 116.7 | 10 | 116.7 | 3750 | 125 | 100 |
| FOD0721 | 10 | 116.7 | 10 | 116.7 | 3750 | 125 | 100 |
| FOD072L | 10 | 115.0 | 9.0 | 115.0 | 3750 | 125 | 105 |
| FOD8001 | 10 | 115.0 | 9.0 | 115.0 | 3750 | 125 | 105 |

ENGINEERING CONSIDERATIONS (NOT FOR FIELD REPRESENTATIVE'S USE):

These devices are optically coupled isolating switches with gallium arsenide light emitting diodes optically coupled to photo detectors. The solid state portion of these devices is encapsulated in a silicon or epoxy compound. The light emitting diode and detector are separated by an insulating window. Internal "chips" are provided with terminals molded into the enclosure.

Use - For use only in products where the acceptability of the combination is determined by Underwriters Laboratories Inc.

CONDITIONS OF ACCEPTABILITY -

Each device shall be reviewed with respect to the following conditions of acceptability:

1. The short circuit interrupting capacity or behavior under short circuit conditions has not been evaluated for these devices. Accordingly, the end-use circuit should contain suitable impedance to eliminate the need for such testing or appropriate tests should be conducted.
2. The device shall be installed in compliance with the enclosure, mounting, spacings and segregation requirements of the ultimate application. No spacings are specified for the device.
3. The suitability of use when exposed to oil, chemicals and the like has not been determined by this investigation.
4. The electrical and outer surface temperature ratings shall be acceptable in the ultimate application.
5. The suitability of the connections shall be determined in the end-use application.

CONDITIONS OF ACCEPTABILITY - (Cont'd)

6. The capability of the device to control a load has not been investigated.
7. The suitability of the device to be mounted over dead metal or metal of opposite polarity has not been investigated.
8. These devices are intended for factory wiring only.

CONSTRUCTION DETAILS:

General - The general design, shape and arrangement shall be as illustrated in the following descriptive pages and illustrations. All dimensions are approximate.

Markings - Each component is marked with the company's name or "Q" or **f**, above or before the type designation. The package code will be specified after a three-digit date code. See the nomenclature below for more details. Markings may appear on the smallest shipping container.

Example device marking:

f 2712
YXXS

Nomenclature:

f or Q denotes Company logo.

2712: Denotes device type. The '2712' is the marking for the FOD2712 device. The prefix 'FOD' will be ignored in the device marking. If the type number starts with a 0 then the 0 will be omitted from the marking. Example: For model FOD050L, the type number would be indicated in the device marking as **f** 50L.

YXX: Denotes Date code,
where Y = One digit year code, Example: 3 indicates year 2003.
XX = Two digit week code

S: Denotes Package Code S

V: Optional - Denotes VDE 0884 approval mark

Specification Sheet - Specification sheet shall be available at the manufacturing facility and shall contain the following information in tabular or graphic format:

1. Device Pin Connections.
2. Maximum continuous power, a current and a voltage rating for both the photo-emitter and the photo-detector.
3. A dielectric insulation-voltage rating between input and output terminals. This should be the same as the isolation V ac in the ratings above.
4. The maximum operating temperature of the device case.
5. Derating specification related to ambient temperatures.

Model Differences - All models have identical insulation systems. The only difference is the lead-frame design or the size of the IC devices.

Abbreviation - R/C = Recognized Component.

*

Package Dimensions - See ILL 1 for details.

*

File E90700
Project 04SC04300

July 20, 2004

REPORT

ON

COMPONENT - OPTICAL ISOLATORS

FAIRCHILD SEMICONDUCTOR CORP
San Jose, CA

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DESCRIPTION

PRODUCT COVERED:

USR, CNR - Optical Isolator, Types FODB1XX, where XX can be any two numerical digits from 00 to 99.

RATINGS:

| Model No. | Current, mA | | Power, mW | | Isolation | Maximum |
|-----------|-------------|----------|-----------|----------|-----------------|------------------------|
| | Diode | Detector | Diode | Detector | Voltage (ac) | Operating Temp., °C |
| FODB100 | 30 | 50 | 40 | 150 | 2500 | 125 |

The junction temperature of the models described in this section is 130°C.

ENGINEERING CONSIDERATIONS (NOT FOR FIELD REPRESENTATIVE'S USE):

These devices are optically coupled isolating switches with gallium arsenide light emitting diodes optically coupled to photo detectors. The solid state portion of these devices is encapsulated in a silicone or epoxy compound. The light emitting diode and detector are separated by an insulating window. Internal "chips" are provided with terminals molded into the enclosure.

Use - For use only in products where the acceptability of the combination is determined by Underwriters Laboratories Inc.

USR indicates investigation to the U.S. Standard for Safety for Optical Isolators, UL 1577, 4th Edition dated May 10, 2000.

CNR indicates investigation to the Canadian Component Acceptance Service No. 5A for Optical Isolators dated January 23, 1998.

Conditions of Acceptability - When installed in the end-product, each device shall be reviewed with respect to the following conditions of acceptability:

1. The short circuit interrupting capacity or behavior under short circuit conditions has not been evaluated for these devices. Accordingly, the end-use circuit should contain suitable impedance to eliminate the need for such testing or appropriate tests should be conducted.
2. The device shall be installed in compliance with the enclosure, mounting, spacings and segregation requirements of the ultimate application. No spacings are specified for the device.
3. The suitability of use when exposed to oil, chemicals and the like has not been determined by this investigation.
4. The electrical and outer surface temperature ratings shall be acceptable in the ultimate application.
5. The suitability of the connections shall be determined in the end-use application.

CONSTRUCTION DETAILS:

General - The general design, shape and arrangement shall be as illustrated in the following descriptive pages and illustrations. All dimensions are approximate.

Marking - Recognized company name or trademark and type designation provided on each unit.

Specification Sheet - Specification sheets shall be available at the manufacturing facility and shall contain the following information in tabular or graphic format.

1. Maximum continuous power, a current and a voltage rating for both the photo-emitter and the photo-sensor.
2. A dielectric insulation-voltage rating between input and output terminals. This should be the same as the isolation V ac shown in this section.
3. The maximum operating temperature of the device case.
4. Derating specification related to ambient temperatures.

Abbreviation - R/C = Recognized Component.

Pin Connections - See ILLs. 1 and 2 for details.

Model Dimensions - See ILL. 1 for details.

Model Differences - All models are identical in construction and ratings, except differ by an electrically screened parameter.

File E90700
Project 05CA04520

August 05, 2005

REPORT

ON

COMPONENT - OPTICAL ISOLATORS

Fairchild Semiconductor Corp
San Jose, CA 95134

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DESCRIPTION

PRODUCT COVERED:

USR - Single Protection Optical Isolator, Type KOI00003, may be followed by any number or letter.

RATINGS:

| Model | Current (mA) | | Power (mW) | | Isolation Voltage | Max Ambient Temp (°C) | Max Storage Temp (°C) | Max Junction Temp (°C) |
|---------|--------------|--------|------------|--------|-------------------|-----------------------|-----------------------|------------------------|
| | Emitter | Sensor | Emitter | Sensor | | | | |
| KOI0003 | 50 | 20 | 100 | 100 | 12,000 Vac | 70 | 70 | 80 |

ENGINEERING CONSIDERATIONS (NOT FOR FIELD REPRESENTATIVE'S USE):

These devices are optically coupled isolating switches with light emitting diodes optically coupled to photo transistors. This device consists of a discrete LED (emitter) and a discrete phototransistor (detector) housed in a solid black light tube.

USR indicates investigation to the US Standard for safety for Optical Isolators, UL 1577.

Use - For use only in products where the acceptability of the combination is determined by Underwriters Laboratories Inc.

Conditions of Acceptability - Each device shall be reviewed with respect to the following conditions of acceptability:

1. The short circuit interrupting capacity, or behavior under short circuit conditions, has not been evaluated for these devices. Accordingly, the end-use circuit should contain suitable impedance to eliminate the need for such testing, or appropriate tests should be conducted.
2. The device shall be installed in compliance with the enclosure, mounting, spacings, and segregation requirements of the ultimate application. No spacings are specified for the device.
3. The suitability of use when exposed to oil, chemicals and the like has not been determined by this investigation.
4. The suitability of the connections shall be determined in the end-use application.
5. The capability of the device to control a load has not been investigated.
6. The suitability of the device to be mounted over dead metal or metal of opposite polarity has not been investigated.
7. These devices are intended for factory wiring only.

CONSTRUCTION DETAILS:

General - The general design, shape and arrangement shall be as illustrated in the following descriptive pages and illustrations. All dimensions are approximate.

Marking - Recognized company name or trademark, and type designation provided on each device or on the smallest shipping carton in which the device is shipped.

Specification Sheet - Specification sheet is provided and contains the following information in tabular or graphic format.

1. Maximum continuous power, current and voltage rating for both the photo-emitter and the photo-sensor.
2. A dielectric insulation-voltage rating between input and output terminals. This should be the same as the isolation V ac.
3. The maximum operating temperature (ambient temperature rating).
4. Derating specifications related to ambient temperatures.
5. Ratings may be expressed in tabular or graphic format.

Model Differences - All models have identical insulation systems. The only difference is in the lead frame construction.

Abbreviation - R/C = Recognized Component.

Pin Connections - See ILL. 1 for details.

Model Dimensions - See ILL. 1 for details.

MANUFACTURING AND PRODUCTION LINE TESTS

TEST TO BE CONDUCTED BY MANUFACTURER:

Dielectric Voltage-Withstand Test -

Each optical isolator shall withstand, as a routine production-line test, the application of a potential between the input and output terminals. For an optical isolator having an ac isolation voltage rating, the frequency of the applied potential shall be 40 - 70 Hz. A dc test potential shall be applied for an optical isolator having a dc rated dielectric insulation voltage. A dc potential equal to 1.414 times the specified 40 - 70 Hz potential may be used if an ac rated optical isolator has solid state components that may be damaged by an ac potential.

The production-line test potential shall be the rated dielectric insulation voltage for 60 seconds or 120 percent of the rated dielectric insulation voltage for one second. For a double protection optical isolator, the test potential is to be the rated isolation rms voltage or 2500 V, whichever is greater.

The product may be in a heated or unheated condition for the test.

TEST EQUIPMENT PROVIDED BY MANUFACTURER:

The test equipment for conducting the dielectric voltage-withstand test is to have the following features and characteristics:

- a) A means of indicating the test potential, in volts rms,
- b) A 40 - 70 Hz test potential that has:
 - 1) A sinusoidal waveform, and
 - 2) A peak value of the waveform that is not to be less than 1.3 and not more than 1.5 times the root-mean-square value.
- c) An automatic reject feature that rejects any unacceptable unit or an audible or visual indicator of electrical breakdown. If the indicator of breakdown is audible or visual, the indicator is to remain active until the test equipment is reset manually.

If the output of the test-equipment is less than 500 VA, the equipment is to include a voltmeter in the output circuit to indicate the test potential directly.

If the output of the test-equipment is 500 VA or larger, the test potential may be indicated:

- a) By a voltmeter in the primary circuit or in a tertiary-winding circuit,
- b) By a selector switch marked to indicate the test potential, or
- c) In the case of test equipment that has a single output potential, by a marking in a readily visible location to indicate the test potential. When marking is used without an indicating voltmeter, the equipment is to include a positive means, such as an indicator lamp, to indicate that the manual-reset switch actually resets following a dielectric breakdown.

Test equipment other than that described above may be used if found acceptable to accomplish the intended factory control.