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REPORT

ON

COMPONENT - OPTICAL ISOLATORS

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Tucheng, Taipei, Taiwan

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DESCRIPTION

PRODUCT COVERED:

USR, CNR Component - Double Protection Optical isolators, Models 817, CNY75, CQY80, EL101, EL101L, **EL101U**, EL101XH, EL111, EL121, EL121N, EL124, EL124N, EL151, EL161, EL354, EL354L, EL354N, **EL354NU**, EL355, EL355L, EL356, EL356N, EL357, EL357L, EL357N, EL357NH, EL357NL, **EL357NU**, EL3571N, EL359, EL610, EL617, EL7X7, EL8X4, EL8X5, EL8X6, EL8X7, EL8X9, EL844, EL845, EL847, EL2501, EL2514, EL2561, EL2701, EL2701N, EL2705, EL2705N, EL817H, EL817L, EL8171, EL9001, HS817, K233, K817P, TCDT110, TCDT111, TCDT112, TCET110, TCET111, TCET120, VO610A, and, VO615A. "X" may be 0 to 9.

USR, CNR Component - Double Protection Optical isolators, Models 4N, MCT2, CNY17, MOC811, H11A, MOC810, TIL11, CNX3 and SL55.

USR, CNR Component - Double Protection Optical Isolators, Models EL3010, EL3011, EL3012, EL3013, EL3014, EL3020, EL3021, EL3022, EL3023, EL3024, EL3050, EL3051, EL3052, EL3053, EL3054, EL3030, EL3031, EL3032, EL3033, EL3034, EL3040, EL3041, EL3042, EL3043, EL3044, EL3060, EL3061, EL3062, EL3063, EL3064, EL3070, EL3071, EL3072, EL3073, EL3074, EL3080, EL3081, EL3082, EL3083, EL3084, EL3161, EL3162, EL3163, ELM4, ELM6, H11AA1, H11AA2, H11AA3, H11AA4, 4N29, 4N30, 4N31, 4N32, 4N33, H11B1, H11B2, H11B3, H11B255, H11L1, H11L2, H11L3, MOC119, MOC8020, MOC8021, MOC8030, MOC8050, MOC8080, TIL113.

USR, CNR Component - Double Protection Optical isolators, Models EL280, EL281, EL2801, EL3H4, **EL3H4U**, EL3H7, EL3H7H, EL3H7L, EL3H7U, and EL3H71.

USR, CNR Component - Double Protection Optical Isolators, Models EL205, EL206, EL207, EL208, EL211, EL212, EL213, EL215, EL216, EL217, ELD205, ELD206, ELD207, ELD208, ELD211, ELD213, and ELD217.

USR, CNR Component - Double Protection Optical Isolators, Models ELD3H4, ELD3H5, ELD3H6, ELD3H7, ELQ3H4, ELQ3H5, ELQ3H7.

All Models may be followed by any letters or numbers.

GENERAL:

These devices are photocoupled isolators consisting of a gallium arsenide light emitting diode, optically coupled to a silicone phototransistor. They are intended to be used in applications where the suitability of the combination has been determined by Underwriters Laboratories Inc. Only the insulating function, for the rated dielectric insulation voltage, between the input and output of the device has been investigated.

MAXIMUM RATINGS CONTINUED (at nominal operating temperature) Cont'd:

Model	Current (mA)		Power (mW)		Isolation Voltage	Max Operating Temp (°C)	Max Junction Temp (°C)	Max Storage Temp (°C)
	Emitter	Sensor	Emitter	Sensor				
EL101	60	50	100	150	5000	110	125	125
EL101L	60	50	100	150	5000	110	125	125
EL101U	50	50	70	150	3750	125	150	150
EL101XH	60	50	100	150	5000	125	130	150
EL111	60	50	100	150	5000	110	125	125
EL121, EL121N	50	50	70	150	3750	110	125	125
EL124, EL124N	50	50	70	150	3750	110	125	125
EL205	60	150	90	150	3750	110	125	150
EL151	60	100	100	150	5000	110	125	125
EL161	60	50	100	150	5000	110	125	125
ELD205	60	150	90	150	3750	110	125	150
EL206	60	150	90	150	3750	110	125	150
ELD206	60	150	90	150	3750	110	125	150
EL207	60	150	90	150	3750	110	125	150
ELD207	60	150	90	150	3750	110	125	150
EL208	60	150	90	150	3750	110	125	150
ELD208	60	150	90	150	3750	110	125	150
EL211	60	150	90	150	3750	110	125	150
ELD211	60	150	90	150	3750	110	125	150
EL212	60	150	90	150	3750	110	125	150
EL213	60	150	90	150	3750	110	125	150
ELD213	60	150	90	150	3750	110	125	150
EL215	60	150	90	150	3750	110	125	150
EL216	60	150	90	150	3750	110	125	150
EL217	60	150	90	150	3750	110	125	150
ELD217	60	150	90	150	3750	110	125	150
EL3H4	50	50	70	150	3750	110	125	125
EL3H4U	50	50	70	150	3750	125	150	150
EL3H7	50	50	70	150	3750	110	125	125
EL3H7H	50	50	70	150	3750	125	130	150
EL3H7L	50	50	70	150	3750	110	125	125
EL3H7U	50	50	70	150	3750	125	130	150
EL3H71	50	50	70	150	3750	110	125	125
EL280	50	50	70	150	3750	110	125	125
EL281	50	50	70	150	3750	110	125	125
EL354, EL354N	50	50	70	150	3750	110	125	125
EL354L	60	50	100	150	5000	110	125	125
EL354NU	50	50	70	150	3750	125	150	150
EL355	50	80	70	150	3750	110	125	125
EL355L	60	100	100	150	5000	110	125	125
EL356, EL356N	50	50	70	150	3750	110	125	125
EL357, EL357N	50	50	70	150	3750	110	125	125
EL357L	60	50	100	150	5000	110	125	125
EL357NH	50	50	70	150	3750	125	130	150
EL357NL	50	50	70	150	3750	110	125	125
EL357NU	50	50	70	150	3750	125	150	150
EL3571N	50	50	70	150	3750	110	125	125
EL359	50	50	70	150	3750	110	125	125
EL610	60	50	100	150	5000	110	125	125
EL617	60	50	100	150	5000	110	125	125
EL7X7	60	50	100	150	5000	110	125	125
4N	60	50	100	150	5000	110	125	125
MCT2	60	50	100	150	5000	110	125	125
CNY17	60	50	100	150	5000	110	125	125
MOC811	60	50	100	150	5000	110	125	125
H11A	60	50	100	150	5000	110	125	125
MOC810	60	50	100	150	5000	110	125	125
TIL11	60	50	100	150	5000	110	125	125
CNX3	60	50	100	150	5000	110	125	125
SL55	60	50	100	150	5000	110	125	125
EL8X4	60	50	100	150	5000	110	125	125
EL8X5	60	80	100	150	5000	110	125	125
EL8X6	60	50	100	150	5000	110	125	125
EL8X7, EL2501, EL2514, EL2561, 817	60	50	100	150	5000	110	125	125
EL817H	60	50	100	150	5000	125	130	150
EL817L	60	50	100	150	5000	110	125	125
EL8X9	60	50	100	150	5000	110	125	125
EL2701, EL2701N	50	50	70	150	3750	110	125	125
EL2705, EL2705N	50	50	70	150	3750	110	125	125
EL2801	50	50	70	150	3750	110	125	125

MAXIMUM RATINGS CONTINUED (at nominal operating temperature) Cont'd:

Model	Current (mA)		Power (mW)		Isolation Voltage	Max Operating Temp (°C)	Max Junction Temp (°C)	Max Storage Temp (°C)
	Emitter	Sensor	Emitter	Sensor				
EL8171	60	50	100	150	5000	110	125	125
EL9001	60	50	100	150	5000	110	125	125
H11AA1, H11AA2, H11AA3, H11AA4	60	50	120	150	5000	100	125	125
4N29, 4N30, 4N31, 4N32, 4N33, H11B1, H11B2, H11B3, H11B255, TIL113, MOC119, MOC8020, MOC8021, MOC8030, MOC8050, MOC8080	60	150	120	150	5000	100	125	125
EL3010, EL3011, EL3012, EL3013, EL3014, EL3021, EL3022, EL3020, EL3023, EL3024, EL3050, EL3051, EL3052, EL3053, EL3054, EL3070, EL3071, EL3072, EL3073, EL3074	60	100	100	300	5000	100	125	125
EL3030, EL3031, EL3032, EL3033, EL3034, EL3040, EL3041, EL3042, EL3043, EL3044, EL3061, EL3062, EL3063, EL3060, EL3161, EL3064, EL3162, EL3163, EL3080, EL3081, EL3082, EL3083, EL3084, ELM4, ELM6	60	100	100	300	5000	100	125	125
H11L1, H11L2, H11L3	60	50	120	150	5000	100	125	125
HS817, K817P, TCET110, TCET111, TCET120, VO610A, VO615A	60	50	100	150	5000	110	125	125
CNY75, CQY80, K233, TCDT110, TCDT111, TCDT112	60	50	100	150	5000	110	125	125
ELD3H4, ELD3H6, ELD3H7,	60	50	100	150	3750	110	125	125
ELD3H5	60	100	100	150	3750	110	125	125
ELQ3H4, ELQ3H7	60	50	100	150	3750	110	125	125
ELQ3H5	60	100	100	150	3750	110	125	125
EL844	60	50	100	150	5000	110	125	125
EL845	60	100	100	150	5000	110	125	125
EL847	60	50	100	150	5000	110	125	125

- See ILL. 3 for the Derating Curves of representative models.

ENGINEERING CONSIDERATIONS: (Not for Field Representative's Use)

Use - For use only in (or with) complete equipment where the acceptability of the combination is determined by Underwriters Laboratories Inc.

Special Considerations - The following items are considerations that were used when evaluating this product.

USR indicates investigation to the U.S. Standard for Safety for Optical Isolators, UL 1577, **5th Edition**.

CNR indicates investigation to the Canadian Standard, CAN/CSA Component Acceptance Service Notice No. 5.

Conditions of Acceptability - When installed in the end-product, consideration shall be given to the following:

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. 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.
- *4. 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.
- *5. If the maximum operating (ambient) temperature exceeds the rating noted in the ratings table, additional means should be used to determine if the maximum junction temperature of the device is exceeded.

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.

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

*

MODEL EL8X7 - FIG. 1

General - Represents Models 817, CNY75, CQY80, EL7X7, EL8X4, EL8X5, EL8X6, EL817L, EL8X9, HS817, EL2501, EL2514, EL2561, EL8171, K233, K817P, TCDDT110, TCDDT111, TCDDT112, TCET110, TCET111, TCET120, VO610A, VO615A. See ILL. 1 for details of construction.

- *1. Enclosure - Minimum 0.475 mm thick. Type CV3400H, manufactured by Panasonic **Corp. (E41404)**. Molded using a high temperature and high pressure process.
- Alternate - Same as above except, Type MP-3000, manufactured by Hitachi Chemical Co. Ltd. (E42956).
- * Alternate - Same as above except, Type EME-1100, manufactured by Chang Chun Plastics Co. Ltd. (E59481)/Chang Chun SB (Changshu) Co. Ltd. (E223871).
- Alternate - Same as above except, Chang Chun Plastics Co. Ltd. (E59481)/Chang Chun SB (Changshu) Co. Ltd. (E223871), Type EME-E110G.
- Alternate - Same as above except, Type CV4180 by Panasonic **Corp. (E41404)**.
- *2. Window - Epoxy molded resin. Panasonic **Industrial Devices Materials (Shanghai) Co.Ltd.**, Type CV1400H. Minimum 0.5 mm through insulation spacing between the input and the output circuits. Molded using a high temperature and high pressure process. May be one of the following:
- Alternate - Same as above except, Type NT-8600A, manufactured by Nitto Denko Corp.
- Alternate - Same as above except, Type NT-8600NF, manufactured by Nitto Denko Corp.
- Alternate - Same as above except, Type EC-15, manufactured by Chang Chun Plastics (E59481).
- Alternate - Same as above except, Chang Chun Plastics (E59481), Type EC-15G.
3. Emitter - LED input. Gallium arsenide infrared light emitting diode.
4. Sensor - Bipolar transistor output. Silicon.
5. Junction Coating Material - Silicone resin, Dow Corning, Type JCR-6101UP.
- Alternate - Same as above except, GE-Toshiba, Type TSE3251-H-C.
6. Leads - Metal employed for current-carrying parts shall be of stainless steel, plated steel, copper, silver, gold, nickel, aluminum, an alloy of the same, or an equivalent material.

MODEL EL357

*General - Same as models 817, and EL8X7 shown in Fig. 1, except as noted below. See ILL. 2 for construction details. Also represents Models EL101, EL101L, EL111, EL121, EL121N, EL124, EL124N, EL151, EL161, EL354, EL354L, EL354N, EL355, EL355L, EL356, EL356N, EL357L, EL357N, EL357NL, EL359, EL2701, EL2701N, EL2705, EL2705N, and EL3571N.

1. Enclosure - Epoxy molding compound. Minimum 0.4 mm thick. Molded using a high temperature and high pressure process. May be one of the following:

*Type CV3400H, manufactured by Panasonic Corp. (E41404) .
R/C (QMFZ2) EP-Molding. Cat. No. EME-1100, manufactured by Chang Chun Plastics (E59481) /Chang Chun SB (Changshu) Co. Ltd. (E223871).
R/C (QMFZ2) EP-Molding. Cat. No. EME-E110G, manufactured by Chang Chun Plastics Co. Ltd. (E59481)/Chang Chun SB (Changshu) Co. Ltd. (E223871).
Type HC-10 Type 2, manufactured by Hitachi Chemical Co. Ltd. (E42956).
R/C (QMFZ2), Type MP-3000, manufactured by Hitachi Chemical Co. Ltd. (E42956).

2. Window - Epoxy molded resin minimum 0.4 mm through insulation spacing between the input and the output circuits. Molded using a high temperature and high pressure process. May be one of the following:

*Type CV1400H, manufactured by Panasonic Industrial Devices Materials (Shanghai) Co. Ltd.
Type EC-15L, manufactured by Chang Chun Plastics.
R/C (QMFZ2) EP-Molding. Cat. No. EC-15G, manufactured by Chang Chun Plastics Co. Ltd. (E59481).
Type NT-8600A, manufactured by Nitto Denko Corp.
Type NT-8600NF, manufactured by Nitto Denko Corp.

3. Emitter - LED input. Gallium arsenide infrared light emitting diode.

MODEL EL357 (CONTINUED)

4. Sensor - Bipolar transistor output. Silicon.
5. Junction Coating Material - Silicone resin, Dow Corning, Type JCR-6101UP.
- *6. Leads - **Metal employed for current-carrying parts shall be of stainless steel, plated steel, copper, silver, gold, nickel, aluminum, an alloy of the same, or an equivalent material.**

*

Model CNY17

General - Also represents Models 4N, MCT2, MOC811, H11A, MOC810, TIL11, CNX3 and SL55.

- *1. Enclosure - R/C (QMFZ2) Epoxy molding compound, Type EME-1100, manufactured by Chang Chun Plastics Co. Ltd. (E59481)/Chang Chun SB (Changshu) Co. Ltd. (E223871). Minimum 0.475 mm thick. Molded using a high temperature and high pressure process.

Alternate - Same except, Type CV3400H, manufactured by Panasonic **Corp. (E41404)**.

Alternate - Same except, Type HC-10 Type 2, manufactured by Hitachi Chemical Co. Ltd. (E42956).

Alternate - Same except, Type EME-E110G, manufactured by Chang Chun Plastics Co. Ltd. (E59481)/Chang Chun SB (Changshu) Co. Ltd. (E223871).

- *2. Window - R/C (QMFZ2), Epoxy molded resin, Chang Chun Plastics **Co. Ltd. (E59481)**, Type EC-15. Minimum 0.5 mm through insulation spacing between the input and the output circuits. Molded using a high temperature and high pressure process.

Alternate - Same except Panasonic **Industrial Devices Materials (Shanghai) Co. Ltd.**, Type CV1400H.

Alternate - Same except Nitto Denko Corp., Type NT-8600A.

Alternate - Same except Chang Chun Plastics **Co. Ltd. (E59481)**, Type EC-15G.

3. Emitter - LED input. Gallium arsenide infrared light emitting diode.

4. Sensor - Bipolar transistor output. Silicon.

5. Junction Coating Material - Silicone resin, GE-Toshiba, Type TSE3251-H-C.

Alternate - Silicone resin, Dow Corning, Type JCR-6101UP.

6. Leads - Metal employed for current-carrying parts shall be of stainless steel, plated steel, copper, silver, gold, nickel, aluminum, an alloy of the same, or an equivalent material

MODEL EL617

General - Also represents Models EL610 and EL9001. See ILL. 5 for details.

1. Enclosure - R/C (QMFZ2/8) Epoxy molding compound, Type EME-1100, manufactured by Chang Chun Plastics Co. Ltd. (E59481)/Chang Chun SB (Changshu) Co. Ltd. (E223871). Minimum 0.475 mm thick. Molded using a high temperature and high pressure process.

Alternate - Same as above except, Type EME-E110G, manufactured by Chang Chun Plastics Co. Ltd. (E59481)/Chang Chun SB (Changshu) Co. Ltd. (E223871).

2. Window - R/C (QMFZ2/8), Epoxy molded resin, Chang Chun Plastics **Co. Ltd. (E59481)**, Type EC-15. Minimum 0.5 mm through-insulation thickness between the input and the output circuits. Molded using a high temperature and high pressure process.

Alternate - Same as above except, Chang Chun Plastics **Co. Ltd. (E59481)**, Type EC-15G.

Alternate - Same except Nitto Denko Corp., Type NT-8600A.

3. Emitter - LED input.
4. Sensor - Bipolar transistor output.
5. Junction Coating Material - Silicone resin, GE-Toshiba, Type TSE3251-H-C.
6. Leads - Metal employed for current-carrying parts shall be of stainless steel, plated steel, copper, silver, gold, nickel, aluminum, an alloy of the same, or an equivalent material.

MODEL EL3052

General - Represents Models H11AA1, H11AA2, H11AA3, H11AA4, 4N29, 4N30, 4N31, 4N32, 4N33, H11B1, H11B2, H11B3, H11B255, TIL113, MOC119, MOC8020, MOC8021, MOC8030, MOC8050, MOC8080, EL3010, EL3011, EL3012, EL3013, EL3014, EL3021, EL3020, EL3022, EL3023, EL3024, EL3050, EL3051, EL3053, EL3054, EL3030, EL3031, EL3032, EL3033, EL3034, EL3040, EL3041, EL3042, EL3043, EL3044, EL3060, EL3061, EL3062, EL3063, EL3064, EL3070, EL3071, EL3072, EL3073, EL3074, EL3080, EL3081, EL3082, EL3083, EL3084, EL3161, EL3162, EL3163, ELM4, ELM6, H11L1, H11L2, and H11L3 except where variations are specifically described.

- *1. Outer Mold - R/C (QMFZ2) Epoxy molding resin, Cat. No. EME-1100, manufactured by Chang Chun Plastics Co. Ltd. (E59481) / Chang Chun SB (Changshu) Co. Ltd. (E223871). Molded using high temperature and high pressure process. Minimum 0.48 mm thick on both top and bottom.

Alternate - Same except, Type HC-10 Type 2, manufactured by Hitachi Chemical Co. Ltd. (E42956).

Alternate - Same except, Type EME-E110G, manufactured by Chang Chun Plastics Co. Ltd. (E59481)/ Chang Chun SB (Changshu) Co. Ltd. (E223871).

Alternate - Same except, Type CV3400H, manufactured by Panasonic **Corp. (E41404)**.

- *2. Inner Mold -Epoxy molding resin, Cat. No. EC-15L, manufactured by Chang Chun Plastics Co Ltd. Molded using a high temperature and high pressure process. Minimum 0.5 mm through insulation spacing between the input and output circuit.

Alternate - Same except Nitto Denko Corp., Type NT-8600A.

Alternate - Same except Chang Chun Plastics **Co. Ltd. (E59481)**, Type EC-15G.

Alternate - Same except Panasonic **Industrial Devices Materials (Shanghai) Co. Ltd.**, Type CV1400H.

3. Lead Frame - Metal employed for current-carrying parts shall be of stainless steel, plated steel, copper, silver, gold, nickel, aluminum, an alloy of the same, or an equivalent material.
4. Emitter - LED Input.

5. Sensor -Type tabulated below.

Optical Isolator Models	Sensor Chip Type
H11AA1, H11AA2, H11AA3, H11AA4	Bipolar Transistor
4N29, 4N30, 4N31, 4N32, 4N33, H11B1, H11B2, H11B3, H11B255, TIL113, MOC119, MOC8020, MOC8021, MOC8030, MOC8050, MOC8080	Bipolar Transistor
EL3010, EL3011, EL3012, EL3013 , EL3014 , EL3021, EL3020, EL3022, EL3023, EL3024 , EL3050 , EL3051, EL3052, EL3053 , EL3054 , EL3070 , EL3071 , EL3072 , EL3073 , EL3074	Triac
EL3030 , EL3031, EL3032, EL3033, EL3034 , EL3040 , EL3041, EL3042, EL3043, EL3044 , EL3060 , EL3061, EL3062, EL3063, EL3064 , EL3080 , EL3081, EL3082, EL3083, EL3084 , EL3161, EL3162, EL3163, ELM4, ELM6	Triac
H11L1, H11L2, H11L3	Bipolar Transistor

6. Wire - Metal employed for current-carrying parts shall be of stainless steel, plated steel, copper, silver, gold, nickel, aluminum, an alloy of the same, or an equivalent material.
7. Junction Coating - Silicone. Type JCR-6101UP, manufactured by Dow Corning Toray Co.

MODEL EL3H7

General - Same as models 817, and EL8X7 shown in Fig. 1, except as noted below. Also represents Models EL3H4, EL3H7L, EL3H71, EL280, EL281, and EL2801. See ILL. 4 for details.

- *1. Enclosure - R/C (QMFZ2), Epoxy molding compound, Type CV3400H, manufactured by Panasonic **Corp. (E41404)**. Minimum 0.4 mm thick. Molded using a high temperature and high pressure process. (Canadian component requirements satisfied by US Component Certification.)

Alternate - R/C (QMFZ2/QMFZ8) Epoxy molding compound, Type EME-1100, manufactured by Chang Chun Plastics Co. Ltd. (E59481)/Chang Chun SB (Changshu) Co. Ltd. (E223871). Molded using a high temperature and high pressure process.

Alternate - R/C (QMFZ2) EP-Molding. Cat. No. EME-E110G, manufactured by Chang Chun Plastics (E59481) / Chang Chun SB (Changshu) Co. Ltd. (E223871).

- *2. Window - Panasonic **Industrial Devices Materials (Shanghai) Co. Ltd.**, Type CV1400H. Minimum 0.4 mm through insulation spacing between the input and the output circuits. Molded using a high temperature and high pressure process. (Canadian component requirements satisfied by US Component Certification.)

Alternate - R/C (QMFZ2/QMFZ8), Epoxy molded resin, Chang Chun Plastics, Type EC-15L. Molded using a high temperature and high pressure process.

Alternate - R/C (QMFZ2) EP-Molding. Cat. No. EC-15G, manufactured by Chang Chun Plastics (E59481).

Alternate - Same as above except, Nitto Denko Corp, Type NT-8600A.

3. Emitter - LED input. Gallium arsenide infrared light emitting diode.
4. Sensor - Bipolar transistor output. Silicon.
5. Junction Coating Material - Silicone resin, Dow Corning, Type JCR-6101UP.
6. Leads - Metal employed for current-carrying parts shall be of stainless steel, plated steel, copper, silver, gold, nickel, aluminum, an alloy of the same, or an equivalent material.

MODEL EL205

General - Represents Models EL206, EL207, EL208, EL211, EL212, EL213, EL215, EL216, EL217, ELD205, ELD206, ELD207, ELD208, ELD211, ELD213, and ELD217, except where variations are specifically described.

- *1. Outer Mold - Epoxy molding compound, Cat. No. EME-1100RS, manufactured by Chang Chun Plastics Co Ltd./Chang Chun SB (Changshu) Co. Ltd.. Molded using high temperature and high-pressure process. Minimum 0.33 mm thick on both top and bottom.

Alternate - R/C (QMFZ2) Epoxy molding compound, Cat. No. EME-E110G, manufactured by Chang Chun Plastics Co Ltd. (E59481)/ Chang Chun SB (Changshu) Co. Ltd. (E223871). Molded using high temperature and high-pressure process. Minimum 0.33 mm thick on both top and bottom.

Alternate - Epoxy molding compound, Cat. No. ELER8-500C, manufactured by Edale Technology Co. Ltd. Minimum 0.33 mm thick on both top and bottom. Molded using high temperature and high-pressure process.

2. Inner Mold - Epoxy molding resin, Cat. No. EC-15L, manufactured by Chang Chun Plastics Co Ltd. Molded using a high temperature and high-pressure process. Minimum 0.4 mm through insulation spacing between the input and output circuit.

R/C (QMFZ2), Epoxy molding resin, Cat. No. EC-15G, manufactured by Chang Chun Plastics Co Ltd (**E59481**). Molded using a high temperature and high-pressure process. Minimum 0.4 mm through insulation spacing between the input and output circuit.

Alternate - Same as above except, Nitto Denko Corp, Type NT-8600A.

3. Lead Frame - Metal employed for current-carrying parts shall be of stainless steel, plated steel, copper, silver, gold, nickel, aluminum, an alloy of the same, or an equivalent material.
4. Emitter - LED Input.

5. Sensor -Bipolar Transistor type Output.
- *6. Wire - **Metal employed for current-carrying parts shall be of stainless steel, plated steel, copper, silver, gold, nickel, aluminum, an alloy of the same, or an equivalent material.**
7. Junction Coating - Silicone. Type JCR-6101UP, manufactured by Dow Corning Toray Co.

MODELS ELD3H4, ELD3H5, ELD3H6, ELD3H7

General - Represent Models ELQ3H4, ELQ3H5, ELQ3H7 (ILL. 7)

- *1. Outer Mold - R/C (QMFZ2) Epoxy molding resin, Type EME-1100, manufactured by Chang Chun Plastics Co. Ltd. (E59481)/Chang Chun SB (Changshu) Co. Ltd. (E223871). Molded using high temperature and high pressure process. Minimum 0.4 mm thick on both top and bottom.
- Alternate - Same except, Type HC-10 Type 2, manufactured by Hitachi Chemical Co. Ltd. (E42956).
- Alternate - Same except, Type EME-E110G, manufactured by Chang Chun Plastics Co. Ltd. (E59481)/Chang Chun SB (ChanGshu) Co. Ltd. (E223871).
- Alternate - Same except, Type CV3400H, manufactured by Panasonic **Corp. (E41404)**.
- *2. Inner Mold -Epoxy molding resin, Cat. No. EC-15L, manufactured by Chang Chun Plastics Co Ltd. Molded using a high temperature and high pressure process. Minimum 0.4 mm through insulation spacing between the input and output circuit.
- Alternate - Same except Nitto Denko Corp., Type NT-8600A.
- Alternate - Same except Chang Chun Plastics **Co. Ltd. (E59481)**, Type EC-15G.
- Alternate - Same except Panasonic **Industrial Devices Materials (Shanghai) Co. Ltd**, Type CV1400H.
3. Lead Frame / Bond Wire - Metal employed for current-carrying parts shall be of stainless steel, plated steel, copper, silver, gold, nickel, aluminum, an alloy of the same, or an equivalent material.
4. Emitter - LED Input.
5. Sensor - Bipolar Transistor Output.
6. Junction Coating - Silicone, Type JCR-6101UP, manufactured by Dow Corning Toray Co.

MODEL EL847

General - Same as model EL8X7 shown in Fig. 1, except as noted below.
Also represents Models EL844, EL845

- *1. Enclosure - R/C (QMFZ2), Epoxy molding compound, Type CV3400H, manufactured by Panasonic **Corp. (E41404)**. Minimum 0.475 mm thick. Molded using a high temperature and high pressure process.

Alternate - R/C (QMFZ2/QMFZ8) Epoxy molding compound, Type EME-1100, manufactured by Chang Chun Plastics Co. Ltd. (E59481)/Chang Chun SB (Changshu) Co. Ltd. (E223871). Molded using a high temperature and high pressure process.

Alternate - R/C (QMFZ2) EP-Molding. Type EME-E110G, manufactured by Chang Chun Plastics Co. Ltd. (E59481)/Chang Chun SB (Changshu) Co. Ltd. (E223871).

Alternate - Same except, Type HC-10 Type 2, manufactured by Hitachi Chemical Co. Ltd. (E42956).

- *2. Window - Panasonic **Industrial Devices Materials (Shanghai) Co. Ltd**, Type CV1400H. Minimum 0.5 mm through insulation thick between the input and the output circuits. Molded using a high temperature and high pressure process.

Alternate - R/C (QMFZ2/QMFZ8), Epoxy molded resin, Chang Chun Plastics, Type EC-15L. Molded using a high temperature and high pressure process.

Alternate - R/C (QMFZ2) EP-Molding. Type EC-15G, manufactured by Chang Chun Plastics (E59481).

Alternate - Same except Nitto Denko Corp., Type NT-8600A.

3. Emitter - LED input.
4. Sensor - Bipolar transistor output.
5. Junction Coating Material - Silicone resin, Dow Corning, Type JCR-6101UP.
6. Leads/Bond Wire - Metal employed for current-carrying parts shall be of stainless steel, plated steel, copper, silver, gold, nickel, aluminum, an alloy of the same, or an equivalent material.

MODEL EL817H

General - Same as model EL8X7 shown in Fig. 1, except as noted below.

- *1. Enclosure - R/C (QMFZ2), Epoxy molding compound, Type CV4180, manufactured by Panasonic **Corp. (E41404)**. Minimum 0.475 mm thick. Molded using a high temperature and high pressure process.

Alternate - Same as above except, R/C (QMFZ2), Type EME-E110G, manufactured by manufactured by Chang Chun Plastics Co. Ltd. (E59481)/Chang Chun SB (**Changshu**) Co. Ltd. (E223871).

Alternate - Same as above except, R/C (QMFZ2) Type HC-10 Type 2, manufactured by Hitachi Chemical Co. Ltd. (E42956).

- *2. Window - Type NT-8600A, manufactured by Nitto Denko Corp. Minimum 0.5 mm through insulation thick between the input and the output circuits. Molded using a high temperature and high pressure process.

Alternate - Same as above except, Type X1400H, manufactured by Panasonic **Industrial Devices Materials (Shanghai) Co. Ltd.**

5. Junction Coating Material - Silicone resin, Dow Corning, Type JCR-6101UP.

MODEL EL101XH

General - Same as model EL8X7 shown in Fig. 1, except as noted below.
Also represents Models EL357NH, EL3H7H, EL3H7U

- *1. Enclosure - R/C (QMFZ2), Epoxy molding compound, Type CV4180, manufactured by Panasonic **Corp. (E41404)**. Minimum 0.4 mm thick. Molded using a high temperature and high pressure process.

Alternate - Same as above except, R/C (QMFZ2), Type EME-E110G, manufactured by manufactured by Chang Chun Plastics Co. Ltd. (E59481)/Chang Chun SB (**Changshu**) Co. Ltd. (E223871).

Alternate - Same as above except, R/C (QMFZ2) Type HC-10 Type 2, manufactured by Hitachi Chemical Co. Ltd. (E42956).

- *2. Window - Type NT-8600A, manufactured by Nitto Denko Corp. Minimum 0.4 mm through insulation thick between the input and the output circuits. Molded using a high temperature and high pressure process.

Alternate - Same as above except, Type X1400H, manufactured by Panasonic **Industrial Devices Materials (Shanghai) Co. Ltd.**

5. Junction Coating Material - Silicone resin, Dow Corning, Type JCR-6101UP.

MODEL EL101U

General - Same as model EL8X7 shown in Fig. 1, except as noted below.
Also represents Models EL354NU and EL357NU.

1. Enclosure - R/C (QMFZ2), Epoxy molding compound, Type CV4180, manufactured by Panasonic Corp. (E41404). Minimum 0.4 mm thick. Molded using a high temperature and high pressure process.

Alternate - Same as above except, R/C (QMFZ2), Type EME-E110G, manufactured by manufactured by Chang Chun Plastics Co. Ltd. (E59481)/Chang Chun SB (Changshu) Co. Ltd. (E223871).

Alternate - Same as above except, R/C (QMFZ2) Type HC-10 Type 2, manufactured by Hitachi Chemical Co. Ltd. (E42956).

Alternate - Same as above except, R/C (QMFZ2/QMFZ8) Epoxy molding compound, Type EME-1100, manufactured by Chang Chun Plastics Co. Ltd. (E59481)/Chang Chun SB (Changshu) Co. Ltd. (E223871).

2. Window - Panasonic Industrial Devices Materials (Shanghai) Co. Ltd, Type CV1400H. Minimum 0.4 mm through insulation thick between the input and the output circuits. Molded using a high temperature and high pressure process.

Alternate - R/C (QMFZ2/QMFZ8), Epoxy molded resin, Chang Chun Plastics, Type EC-15L. Molded using a high temperature and high pressure process.

Alternate - R/C (QMFZ2) EP-Molding. Type EC-15G, manufactured by Chang Chun Plastics (E59481).

Alternate - Same except Nitto Denko Corp., Type NT-8600A.

5. Junction Coating Material - Silicone resin, Dow Corning, Type JCR-6101UP.

MODEL EL3H4U

General - Same as model EL8X7 shown in Fig. 1, except as noted below.

1. Enclosure - R/C (QMFZ2), Epoxy molding compound, Type CV4180, manufactured by Panasonic Corp. (E41404). Minimum 0.4 mm thick. Molded using a high temperature and high pressure process.

Alternate - Same as above except, R/C (QMFZ2), Type EME-E110G, manufactured by manufactured by Chang Chun Plastics Co. Ltd. (E59481)/Chang Chun SB (Changshu) Co. Ltd. (E223871).

Alternate - Same as above except, R/C (QMFZ2) Type HC-10 Type 2, manufactured by Hitachi Chemical Co. Ltd. (E42956).

Alternate - Same as above except, R/C (QMFZ2/QMFZ8) Epoxy molding compound, Type EME-1100, manufactured by Chang Chun Plastics Co. Ltd. (E59481)/Chang Chun SB (Changshu) Co. Ltd. (E223871).

Alternate - Same as above except, R/C (QMFZ2), Epoxy molding compound, Type CV3400H, manufactured by Panasonic Corp. (E41404).

Alternate - Same as above except, R/C (QMFZ2), Type MP-3000, manufactured by Hitachi Chemical Co. Ltd. (E42956).

2. Window - Panasonic Industrial Devices Materials (Shanghai) Co. Ltd, Type CV1400H. Minimum 0.4 mm through insulation thick between the input and the output circuits. Molded using a high temperature and high pressure process.

Alternate - R/C (QMFZ2/QMFZ8), Epoxy molded resin, Chang Chun Plastics, Type EC-15L. Molded using a high temperature and high pressure process.

Alternate - R/C (QMFZ2) EP-Molding. Type EC-15G, manufactured by Chang Chun Plastics (E59481).

Alternate - Same except Nitto Denko Corp., Type NT-8600A.

5. Junction Coating Material - Silicone resin, Dow Corning, Type JCR-6101UP.