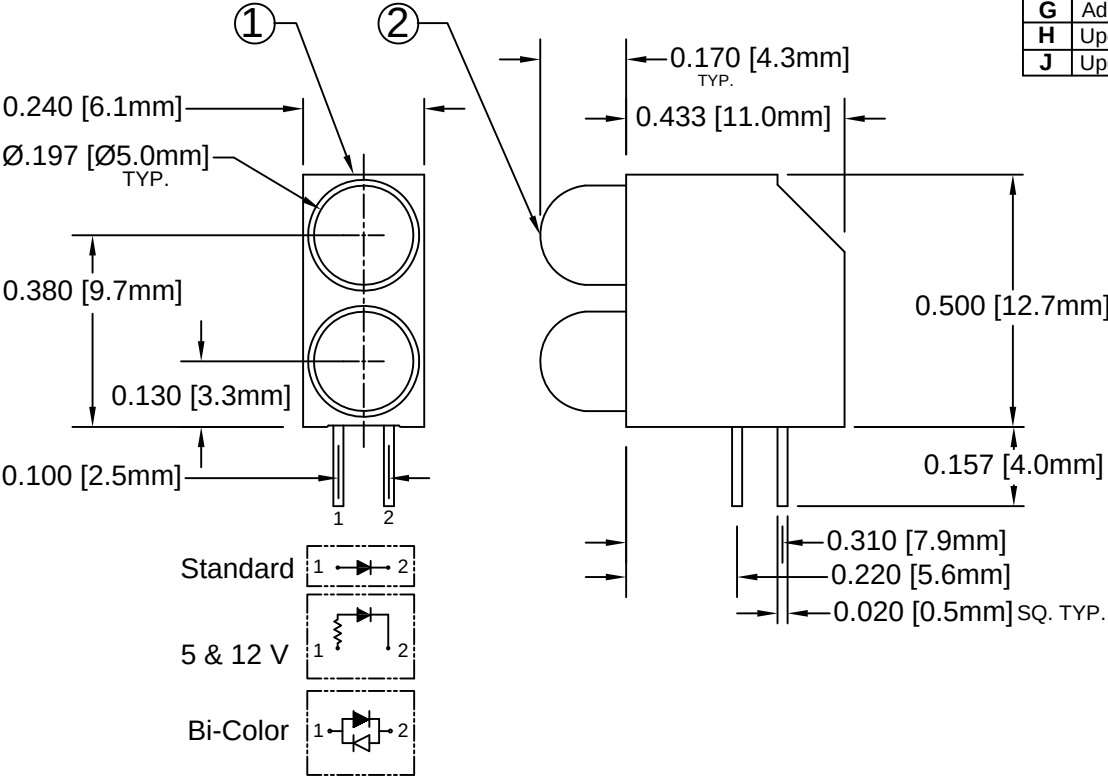


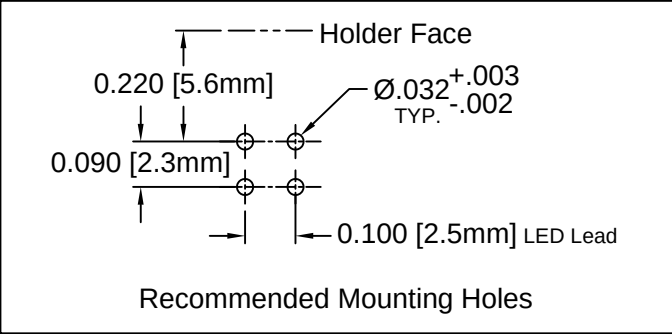
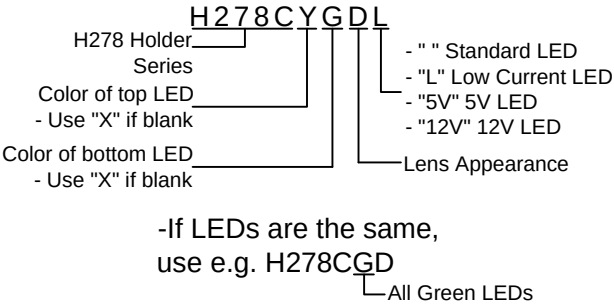
| ITEM | Q'TY | PART NUMBER | PART DESCRIPTION                               |
|------|------|-------------|------------------------------------------------|
| 1    | 1    | H-278C-2    | T-1¾ (5mm) Bi-Level LED Holder, 90° Mount      |
| 2    | 2    | 5XX         | T-1¾ (5mm) Non-Flange LED, See Following Pages |

| REV. | DESCRIPTION                               | DATE     | APPROVED |
|------|-------------------------------------------|----------|----------|
| C    | Corrected Holder from H-278C to H-278C-1. | 02/28/05 | M. C.    |
| D    | Changed Holder from H-278C-1 to H-278C-2. | 02/14/07 | M. C.    |
| E    | Changed LED Protrusion from .180 to .170  | 02/27/07 | M. C.    |
| F    | Added P/N Designation Note                | 03/04/09 | T. Y.    |
| G    | Added H278CGAD                            | 05/29/12 | T. Y.    |
| H    | Updated LED Offering List                 | 06/19/12 | T. Y.    |
| J    | Updated LED Optical Characteristics       | 09/15/15 | J. C.    |



| BI-COLOR POLARITY |             |             |
|-------------------|-------------|-------------|
| LED P/N           | (1) Cathode | (2) Cathode |
| 5BC               | Green       | Red         |
| 5BC-Y/G           | Green       | Yellow      |
| 5BC-R/Y           | Yellow      | Red         |
| 5BC-A/G           | Green       | Amber       |

#### NOTE: P/N CONFIGURATION



## ABSOLUTE MAXIMUM RATINGS (Ta=25° C)

|                                             |                      |
|---------------------------------------------|----------------------|
| REVERSE VOLTAGE                             | 5V                   |
| REVERSE CURRENT                             | 100uA                |
| OPERATING TEMPERATURE RANGE                 | -25° C - 85° C       |
| STORAGE TEMPERATURE                         | -30° C - 100° C      |
| LEAD SOLDERING TEMPERATURE(1/16" FROM BODY) | 260° C FOR 5 SECONDS |

|                                                 |                |                                                                                   |                       |
|-------------------------------------------------|----------------|-----------------------------------------------------------------------------------|-----------------------|
| STANDARD TOLERANCE (UNLESS OTHERWISE SPECIFIED) |                | <p>4 THOMAS, IRVINE, CA. 92618</p> <p>TEL: (949) 951-8808 FAX: (949) 951-3974</p> |                       |
| DECIMALS                                        | ANGULAR        |                                                                                   |                       |
| .X ± .1                                         | X° ± 1°        |                                                                                   |                       |
| .XX ± .02                                       |                |                                                                                   |                       |
| .XXX ± .010                                     |                |                                                                                   |                       |
| DESIGNED: T. Yin                                | DATE: 03/05/04 | <b>TITLE:</b> T-1¾ (5MM) 90° BI-LEVEL LED ASSY                                    |                       |
| CHECKED: D. Green                               | DATE: 03/05/04 | <b>PART NO:</b> H278CXX                                                           | <b>REVISION:</b> J    |
|                                                 |                | <b>CAGE CODE :</b> 32559                                                          | <b>SHEET # 1 OF 4</b> |
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| REV. | DESCRIPTION  | DATE | APPROVED |
|------|--------------|------|----------|
|      | SEE SHEET#1. |      |          |
|      |              |      |          |

| LED Assy. No. | Chip      |                  |               | Lens Appearance | Electro-Optical Data @ 20mA |        |     |          | Viewing Angle<br>2 θ ½<br>(Deg) | LED P/N |
|---------------|-----------|------------------|---------------|-----------------|-----------------------------|--------|-----|----------|---------------------------------|---------|
|               | Material  | Peak Wave Length | Emitted Color |                 | If (mA)                     | Vf (V) |     | Iv (mcd) |                                 |         |
|               |           |                  |               |                 |                             | MAX    | TYP | MAX      | TYP                             |         |
| H278CBWC      | GaN/SiC   | 430              | BLUE          | WATER CLEAR     | 25                          | 4.0    | 4.5 | 25       | 20                              | 5BWC    |
| H278CBWD      | GaN/SiC   | 430              | BLUE          | DIFFUSED        | 25                          | 4.0    | 4.5 | 15       | 45                              | 5BWD    |
| H278CBWT      | GaN/SiC   | 430              | BLUE          | TINTED          | 25                          | 4.0    | 4.5 | 30       | 20                              | 5BWT    |
| H278CGC       | GaP/GaP   | 568              | GREEN         | WATER CLEAR     | 30                          | 2.1    | 2.8 | 40       | 35                              | 5GC     |
| H278CGD       | GaP/GaP   | 568              | GREEN         | DIFFUSED        | 30                          | 2.1    | 2.8 | 25       | 45                              | 5GD     |
| H278CGT       | GaP/GaP   | 568              | GREEN         | TINTED          | 30                          | 2.1    | 2.8 | 40       | 35                              | 5GT     |
| H278CUGC      | AlGaInP   | 570              | GREEN         | WATER CLEAR     | 30                          | 2.1    | 2.4 | 600      | 35                              | 5UGC    |
| H278CPGC      | GaP/GaP   | 555              | PURE GREEN    | WATER CLEAR     | 30                          | 2.2    | 2.8 | 10       | 35                              | 5PGC    |
| H278CPGD      | GaP/GaP   | 555              | PURE GREEN    | DIFFUSED        | 30                          | 2.2    | 2.8 | 10       | 45                              | 5PGD    |
| H278CPGT      | GaP/GaP   | 555              | PURE GREEN    | TINTED          | 30                          | 2.2    | 2.8 | 10       | 35                              | 5PGT    |
| H278CYC       | GaAsP/GaP | 590              | YELLOW        | WATER CLEAR     | 30                          | 2.0    | 2.8 | 40       | 35                              | 5YC     |
| H278CYD       | GaAsP/GaP | 590              | YELLOW        | DIFFUSED        | 30                          | 2.0    | 2.8 | 25       | 45                              | 5YD     |
| H278CYT       | GaAsP/GaP | 590              | YELLOW        | TINTED          | 30                          | 2.0    | 2.8 | 40       | 35                              | 5YT     |
| H278CAC       | GaAsP/GaP | 605              | AMBER         | WATER CLEAR     | 30                          | 2.0    | 2.8 | 40       | 35                              | 5AC     |
| H278CAD       | GaAsP/GaP | 605              | AMBER         | DIFFUSED        | 30                          | 2.0    | 2.8 | 25       | 45                              | 5AD     |
| H278CAT       | GaAsP/GaP | 605              | AMBER         | TINTED          | 30                          | 2.0    | 2.8 | 40       | 35                              | 5AT     |
| H278CHC       | GaAsP/GaP | 625              | HE RED        | WATER CLEAR     | 30                          | 2.0    | 2.8 | 40       | 35                              | 5HC     |
| H278CHD       | GaAsP/GaP | 625              | HE RED        | DIFFUSED        | 30                          | 2.0    | 2.8 | 25       | 45                              | 5HD     |
| H278CHT       | GaAsP/GaP | 625              | HE RED        | TINTED          | 30                          | 2.0    | 2.8 | 40       | 35                              | 5HT     |
| H278CRC       | GaP/GaP   | 700              | RED           | WATER CLEAR     | 20                          | 2.1    | 2.8 | 2        | 35                              | 5RC     |
| H278CRD       | GaP/GaP   | 700              | RED           | DIFFUSED        | 20                          | 2.1    | 2.8 | 2        | 45                              | 5RD     |
| H278CRT       | GaP/GaP   | 700              | RED           | TINTED          | 20                          | 2.1    | 2.8 | 2        | 35                              | 5RT     |
| H278CBC-A/G   | GaAsP/GaP | 605              | AMBER         | WHITE DIFFUSED  | 30                          | 2.0    | 2.8 | 6        | 45                              | 5BC-A/G |
|               | GaP/GaP   | 568              | GREEN         |                 | 30                          | 2.1    | 2.8 | 6        |                                 |         |
| H278CBC       | GaAsP/GaP | 625              | RED           | WHITE DIFFUSED  | 30                          | 2.0    | 2.8 | 6        | 45                              | 5BC     |
|               | GaP/GaP   | 568              | GREEN         |                 | 30                          | 2.1    | 2.8 | 8        |                                 |         |
| H278CBC-R/Y   | GaAsP/GaP | 625              | RED           | WHITE DIFFUSED  | 30                          | 2.0    | 2.8 | 6        | 45                              | 5BC-R/Y |
|               | GaAsP/GaP | 590              | YELLOW        |                 | 30                          | 2.0    | 2.8 | 5        |                                 |         |
| H278CBC-Y/G   | GaAsP/GaP | 590              | YELLOW        | WHITE DIFFUSED  | 30                          | 2.0    | 2.8 | 5        | 45                              | 5BC-Y/G |
|               | GaP/GaP   | 568              | GREEN         |                 | 30                          | 2.1    | 2.8 | 8        |                                 |         |

|                                                                                                            |                          |                                                                                                                                                                     |                       |
|------------------------------------------------------------------------------------------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| STANDARD TOLERANCE<br>( UNLESS OTHERWISE SPECIFIED )<br><u>±10% ALL VALUES</u> <u>ANGULAR</u><br>X°   ± 5° |                          | <br>4 THOMAS, IRVINE, CA. 92618<br>TEL.: (949) 951-8808    FAX: (949) 951-3974 |                       |
|                                                                                                            |                          |                                                                                                                                                                     |                       |
| DESIGNED:<br><b>T. Yin</b>                                                                                 | DATE:<br><b>03/05/04</b> | TITLE: T-1¾ (5MM)<br>90° BI-LEVEL LED ASSY                                                                                                                          |                       |
| CHECKED:<br><b>D. Green</b>                                                                                | DATE:<br><b>03/05/04</b> | PART NO:<br><b>H278CXX</b>                                                                                                                                          | REVISION:<br><b>J</b> |
|                                                                                                            |                          | CAGE CODE : <b>32559</b>                                                                                                                                            | SHEET # <b>2 OF 4</b> |
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| REV. | DESCRIPTION  | DATE | APPROVED |
|------|--------------|------|----------|
|      | SEE SHEET#1. |      |          |
|      |              |      |          |

| LED Assy. No. | Chip        |                  |               | Lens Appearance | Electro-Optical Data @ 20mA |           |     |             | Viewing Angle<br>2 θ ½<br>(Deg) | LED P/N   |
|---------------|-------------|------------------|---------------|-----------------|-----------------------------|-----------|-----|-------------|---------------------------------|-----------|
|               | Material    | Peak Wave Length | Emitted Color |                 | If<br>(mA)                  | Vf<br>(V) |     | Iv<br>(mcd) |                                 |           |
|               |             |                  |               |                 |                             | MAX       | TYP |             |                                 |           |
| H278CUBWC     | InGaN/SiC   | 468              | BLUE          | WATER CLEAR     | 50                          | 3.2       | 3.6 | 5000        | 15                              | 5BWC2.515 |
| H278CSGC      | GaP/GaP     | 568              | GREEN         | WATER CLEAR     | 30                          | 2.1       | 2.8 | 60          | 35                              | 5SGC      |
| H278CSGD      | GaP/GaP     | 568              | GREEN         | DIFFUSED        | 30                          | 2.1       | 2.8 | 50          | 45                              | 5SGD      |
| H278CSGT      | GaP/GaP     | 568              | GREEN         | TINTED          | 30                          | 2.1       | 2.8 | 60          | 35                              | 5SGT      |
| H278CSYC      | GaAsP/GaP   | 590              | YELLOW        | WATER CLEAR     | 30                          | 2.0       | 2.8 | 600         | 35                              | 5SYC      |
| H278CSYD      | GaAsP/GaP   | 590              | YELLOW        | DIFFUSED        | 30                          | 2.0       | 2.8 | 150         | 45                              | 5SYD      |
| H278CSYT      | GaAsP/GaP   | 590              | YELLOW        | TINTED          | 30                          | 2.0       | 2.8 | 600         | 35                              | 5SYT      |
| H278CSRC      | GaAlAs/GaAs | 645              | SUPER RED     | WATER CLEAR     | 30                          | 1.7       | 2.4 | 60          | 35                              | 5SRC      |
| H278CSRD      | GaAlAs/GaAs | 645              | SUPER RED     | DIFFUSED        | 30                          | 1.7       | 2.4 | 40          | 45                              | 5SRD      |
| H278CSRT      | GaAlAs/GaAs | 645              | SUPER RED     | TINTED          | 30                          | 1.7       | 2.4 | 60          | 35                              | 5SRT      |
| H278CUGC      | AlGaInP     | 570              | GREEN         | WATER CLEAR     | 30                          | 2.1       | 2.4 | 400         | 35                              | 5UGC      |
| H278CSUGC     | AlGaInP     | 570              | GREEN         | WATER CLEAR     | 30                          | 2.1       | 2.4 | 300         | 35                              | 5SUGC     |
| H278CUYC      | AlGaInP     | 590              | YELLOW        | WATER CLEAR     | 30                          | 2.0       | 2.4 | 1000        | 30                              | 5UYC      |
| H278CSUYC     | AlGaInP     | 590              | YELLOW        | WATER CLEAR     | 30                          | 2.0       | 2.4 | 700         | 35                              | 5SUYC     |
| H278CUUYC     | AlGaInP     | 590              | YELLOW        | WATER CLEAR     | 30                          | 2.0       | 2.4 | 500         | 35                              | 5UUYC     |
| H278CUOC      | AlGaInP     | 625              | ORANGE        | WATER CLEAR     | 30                          | 1.8       | 2.4 | 1400        | 35                              | 5UOC      |
| H278CUOC      | AlGaInP     | 625              | ORANGE        | WATER CLEAR     | 30                          | 1.8       | 2.4 | 1300        | 35                              | 5SUOC     |
| H278CURC      | GaAlAs/GaAs | 645              | RED           | WATER CLEAR     | 30                          | 1.7       | 2.4 | 400         | 30                              | 5URC      |
| H278CSURC     | AlGaInP     | 640              | RED           | WATER CLEAR     | 30                          | 1.8       | 2.4 | 500         | 35                              | 5SURC     |
| H278CUWC      | InGaN/SiC   | 6500K            | WHITE         | WATER CLEAR     | 100                         | 3.5       | 4.2 | 2700        | 30                              | 5WC2.730  |

|                                                                                                            |                          |                                                                                                                                                                     |                       |
|------------------------------------------------------------------------------------------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
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|                                                                                                            |                          |                                                                                                                                                                     |                       |
| DESIGNED:<br><b>T. Yin</b>                                                                                 | DATE:<br><b>03/05/04</b> | TITLE: T-1¾ (5MM)<br>90° BI-LEVEL LED ASSY                                                                                                                          |                       |
| CHECKED:<br><b>D. Green</b>                                                                                | DATE:<br><b>03/05/04</b> | PART NO:<br><b>H278CXX</b>                                                                                                                                          | REVISION:<br><b>J</b> |
|                                                                                                            |                          | CAGE CODE : 32559                                                                                                                                                   | SHEET # 3 OF 4        |
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|      | SEE SHEET#1. |      |          |
|      |              |      |          |

| LED Assy. No. | Peak Wave Length<br>$\lambda_p$ (nm) | Emitted Color | Lens Appearance | Max. Rating | Electro-Optical Data @ 2mA |     |             | Viewing Angle<br>2 $\theta$ ½<br>(Deg) | LED P/N |
|---------------|--------------------------------------|---------------|-----------------|-------------|----------------------------|-----|-------------|----------------------------------------|---------|
|               |                                      |               |                 | If<br>(mA)  | Vf<br>(V)                  |     | Iv<br>(mcd) |                                        |         |
|               |                                      |               |                 | MAX         | TYP                        | MAX | TYP         |                                        |         |
| H278CBWDL     | 430                                  | BLUE          | DIFFUSED        | 7           | 3.8                        | 4.2 | 4           | 45                                     | 5BWDL   |
| H278CPGDL     | 555                                  | PURE GREEN    | DIFFUSED        | 7           | 2.1                        | 2.6 | 1           | 45                                     | 5PGDL   |
| H278CGDL      | 568                                  | GREEN         | DIFFUSED        | 7           | 2.1                        | 2.6 | 4           | 45                                     | 5GDL    |
| H278CYDL      | 590                                  | YELLOW        | DIFFUSED        | 7           | 2.0                        | 2.6 | 4           | 45                                     | 5YDL    |
| H278CADL      | 605                                  | AMBER         | DIFFUSED        | 7           | 2.0                        | 2.6 | 4           | 45                                     | 5ADL    |
| H278CHDL      | 625                                  | HE RED        | DIFFUSED        | 7           | 2.0                        | 2.6 | 5           | 45                                     | 5HDL    |
| H278CSRDL     | 645                                  | SUPER RED     | DIFFUSED        | 7           | 1.7                        | 2.3 | 6           | 45                                     | 5SRDL   |

| LED Assy. No. | Peak Wave Length<br>λp(nm) | Emitted Color | Lens Appearance | Electro-Optical Data |           |     |             | Viewing Angle<br>2 θ½<br>(Deg) | LED P/N |
|---------------|----------------------------|---------------|-----------------|----------------------|-----------|-----|-------------|--------------------------------|---------|
|               |                            |               |                 | If<br>(mA)           | Vf<br>(V) |     | Iv<br>(mcd) |                                |         |
|               |                            |               |                 | MAX                  | TYP       | MAX | TYP         |                                |         |
| 5 Volt        |                            |               |                 | Data @ 5V            |           |     |             |                                |         |
| H278CBWD5V    | BLUE                       | 430           | DIFFUSED        | -                    | -         | 5   | 15          | 45                             | 5BWD5V  |
| H278CGC5V     | GREEN                      | 568           | WATER CLEAR     | -                    | -         | 5   | 40          | 35                             | 5GC5V   |
| H278CGD5V     | GREEN                      | 568           | DIFFUSED        | -                    | -         | 5   | 25          | 45                             | 5GD5V   |
| H278CGT5V     | GREEN                      | 568           | TINTED          | -                    | -         | 5   | 40          | 35                             | 5GT5V   |
| H278CAD5V     | AMBER                      | 605           | DIFFUSED        | -                    | -         | 5   | 25          | 45                             | 5AD5V   |
| H278CHD5V     | HE RED                     | 625           | DIFFUSED        | -                    | -         | 5   | 30          | 45                             | 5HD5V   |
| H278CRD5V     | RED                        | 700           | DIFFUSED        | -                    | -         | 5   | 1.5         | 45                             | 5RD5V   |
| H278CYD5V     | YELLOW                     | 590           | DIFFUSED        | -                    | -         | 5   | 25          | 45                             | 5YD5V   |
| 12 Volt       |                            |               |                 | Data @ 12V           |           |     |             |                                |         |
| H278CGC12V    | GREEN                      | 568           | WATER CLEAR     | -                    | -         | 12  | 40          | 35                             | 5GC12V  |
| H278CGD12V    | GREEN                      | 568           | DIFFUSED        | -                    | -         | 12  | 25          | 45                             | 5GD12V  |
| H278CHC12V    | HE RED                     | 625           | WATER CLEAR     | -                    | -         | 12  | 50          | 35                             | 5HC12V  |
| H278CHD12V    | HE RED                     | 625           | DIFFUSED        | -                    | -         | 12  | 30          | 45                             | 5HD12V  |
| H278CRC12V    | RED                        | 700           | WATER CLEAR     | -                    | -         | 12  | 2           | 35                             | 5RC12V  |
| H278CRD12V    | RED                        | 700           | DIFFUSED        | -                    | -         | 12  | 1.5         | 45                             | 5RD12V  |
| H278CYC12V    | YELLOW                     | 590           | WATER CLEAR     | -                    | -         | 12  | 25          | 35                             | 5YC12V  |
| H278CYD12V    | YELLOW                     | 590           | DIFFUSED        | -                    | -         | 12  | 20          | 45                             | 5YD12V  |

|                                                                                                                |  |                                                                                                                                                                       |  |
|----------------------------------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
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|                                                                                                                |  |                                                                                  |  |
| DESIGNED:<br><b>T. Yin</b>                                                                                     |  | DATE:<br><b>03/05/04</b>                                                                                                                                              |  |
| CHECKED:<br><b>D. Green</b>                                                                                    |  | DATE:<br><b>03/05/04</b>                                                                                                                                              |  |
|                                                                                                                |  | TITLE:<br>T-1¾ (5MM)<br>90° BI-LEVEL LED ASSY                                                                                                                         |  |
|                                                                                                                |  | PART NO: H278CXX                                                                                                                                                      |  |
|                                                                                                                |  | REVISION:<br>J                                                                                                                                                        |  |
|                                                                                                                |  | CAGE CODE : 32559      SHEET # 4 OF 4                                                                                                                                 |  |
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## JONHON

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