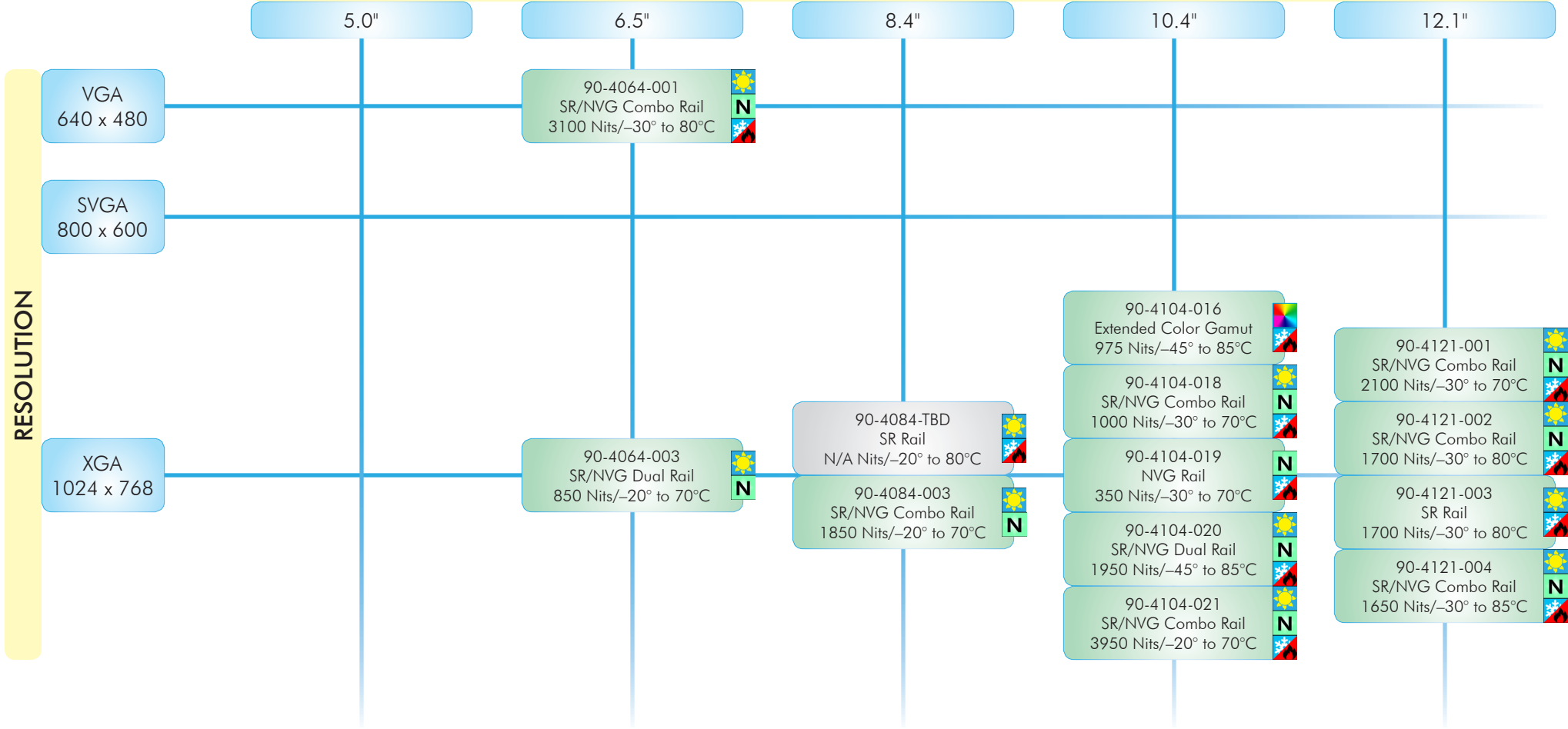


# ENHANCED DISPLAYS LINE-UP

Last Update: 2018 May 8

4:3 aspect ratio

DISPLAY SIZE (diagonal)



In Development
In Production
End of Life
High Brightness
NVG Compatible
Extended Operating Temperature Range
Extended Color Gamut
Transflective Enhancement























# ENHANCED DISPLAYS LINE-UP

Last Update: 2018 May 8

4:3/5:4 aspect ratio

DISPLAY SIZE (diagonal)

RESOLUTION

|                     | 15.0"   | 17.0"  | 19.0" | 20.1"  | 21.3"   |  |
|---------------------|---|--|-------|--|---|--|
| XGA<br>1024 x 768   | 90-4150-010<br>SR/NVG Combo Rail<br>900 Nits/-20° to 70°C<br>   |  |       |  |   |  |
| SXGA<br>1280 x 1024 | 90-4150-011<br>SR Rail<br>1350 Nits/-30° to 85°C<br>            |  |       |  |   |  |
|                     | 90-4150-012<br>SR/NVG Combo Rail<br>1350 Nits/-30° to 85°C<br>  |  |       |  |   |  |
| UXGA<br>1600 x 1200 |   | 90-4170-005<br>SR/NVG Combo Rail<br>950 Nits/-30° to 85°C<br>  |       | 90-4190-009<br>SR Rail<br>1550 Nits/0° to 50°C<br>  |   |  |
|                     |   | 90-4170-006<br>SR Rail<br>950 Nits/-30° to 85°C<br>            |       | 90-4190-010<br>SR/NVG Combo Rail<br>950 Nits/0° to 50°C<br>                |   |  |
|                     |   |  |       | 90-4190-013<br>SR/NVG Combo Rail<br>1300 Nits/-30° to 85°C<br>             |   |  |
|                     |   |  |       | 90-9190-004<br>Extended Color/Transflective<br>500 Nits/-30° to 85°C<br>  |   |  |
|                     |   |  |       | 90-4201-007<br>Std/NVG Combo Rail<br>550 Nits/0° to 60°C<br>  |   | 90-4213-002<br>SR/NVG Combo Rail<br>1200 Nits/0° to 60°C<br>  |
|                     |   |  |       |  | 90-4213-003<br>SR Direct Lit Backlit<br>1950 Nits/0° to 60°C<br> |  |
|                     |   |  |       |  | 90-4213-004<br>SR Direct Lit Backlit<br>1200 Nits/0° to 50°C<br> |  |













|                |               |             |   |  |  |  |   |
|----------------|---------------|-------------|---|--|--|--|---|
| In Development | In Production | End of Life |  High Brightness |  NVG Compatible |  Extended Operating Temperature Range |  Extended Color Gamut |  Transflective Enhancement |
|----------------|---------------|-------------|---|--|--|--|---|

# ENHANCED DISPLAYS LINE-UP

Last Update: 2018 May 8

16:9 aspect ratio


DISPLAY SIZE (diagonal)

|                            | 15.6"  | 17.3"  | 18.5"  | 21.5"   | 24.0"   |
|----------------------------|--|--|--|---|---|
| <b>FHD</b><br>1920 x 1080  | 90-4156-002<br>SR Edge Lit Backlight<br>1350 Nits/-10° to 70°C    | 90-4173-001<br>SR/NVG Combo Rail<br>950 Nits/0° to 70°C  | 90-4185-001<br>SR/NVG Combo Rail<br>N/A Nits/N/A° to N/A°C  | 90-4215-003<br>SR/NVG Combo Rail<br>850 Nits/0° to 50°C   | 90-4240-002<br>SR/NVG Combo Rail<br>750 Nits/-20° to 70°C   |
| <b>WQHD</b><br>2560 x 1440 | 90-4156-003<br>SR/NVG Combo Rail<br>1300 Nits/-10° to 70°C   |  |  | 90-4215-006<br>SR Direct Lit Backlight<br>1050 Nits/0° to 50°C   | 90-4240-003<br>SR/NVG Combo Rail<br>900 Nits/0° to 50°C     |
| <b>4K</b><br>4096 x 2160   |  |  |  |   |   |

In Development

In Production

End of Life

 High Brightness

 NVG Compatible

 Extended Operating Temperature Range

 Extended Color Gamut

 Transflective Enhancement

# ENHANCED DISPLAYS LINE-UP

Last Update: 2018 May 8

## SPECIFICATIONS

|                                | 6.5"              |                    | 8.4"                 |                      | 10.4"                |                   |                   |
|--------------------------------|-------------------|--------------------|----------------------|----------------------|----------------------|-------------------|-------------------|
| <b>Part Number</b>             | 90-4064-001       | 90-4064-003        | 90-4084-TBD          | 90-4084-003          | 90-4104-016          | 90-4104-018       | 90-4104-019       |
| <b>Status</b>                  | In Production     | In Production      | Under Development    | In Production        | In Production        | In Production     | In Production     |
| <b>Resolution</b>              | 640 x 480         | 1024 x 768         | 1024 x 768           | 1024 x 768           | 1024 x 768           | 1024 x 768        | 1024 x 768        |
| <b>Brightness @ Rail Temp.</b> | 3100 nits @ 50°C  | 850 nits @ 50°C    | N/A                  | 1850 nits @ 47°C     | 975 nits @ 70°C      | 1000 nits @ 60°C  | 350 nits @ 50°C   |
| <b>Contrast Ratio</b>          | 650:1             | 850:1              | N/A                  | 700:1                | N/A                  | 1100:1            | N/A               |
| <b>Weber Class</b>             | 6                 | 5                  | N/A                  | 6                    | N/A                  | 5                 | N/A               |
| <b>Display Mode</b>            | SR/NVIS           | SR/NVIS            | SR                   | SR/NVIS              | Extended Color Gamut | SR/NVIS           | NVIS              |
| <b>Colors</b>                  | 6-bit/6-bit + FRC | 6-bit/6-bit + FRC  | 6-bit/6-bit + Hi-FRC | 6-bit/8-bit + Hi-FRC | 6-bit/6-bit + FRC    | 6-bit/6-bit + FRC | 6-bit/6-bit + FRC |
| <b>Response Time</b>           | 3/15 ms           | 6/19 ms            | 13/12 ms             | 13/12 ms             | 25 ms                | 14/11 ms          | 14/11 ms          |
| <b>Viewing Angle</b>           | ±80° H/±80° V     | ±80° H/+80, -60° V | ±88° H/±88° V        | ±88° H/±88° V        | ±85° H/±85° V        | ±88° H/±88° V     | ±88° H/±85° V     |
| <b>NTSC</b>                    | 40%               | 36%                | 72%                  | 71%                  | 104%                 | 55%               | 55%               |
| <b>Technology</b>              | TN                | TN                 | α-Si TFT             | α-Si TFT             | ADS                  | Super MVA         | Super MVA         |
| <b>Operating Temperature</b>   | -30°C to 80°C     | -20°C to 70°C      | -20°C to 80°C        | -20°C to 70°C        | -45°C to 85°C        | -30°C to 70°C     | -30°C to 70°C     |
| <b>Storage Temperature</b>     | -30°C to 80°C     | -30°C to 80°C      | -30°C to 80°C        | -30°C to 80°C        | -55°C to 85°C        | -30°C to 80°C     | -30°C to 80°C     |
| <b>Backlight Power</b>         | 8 W               | 29 W               | N/A                  | 10.5 W               | N/A                  | 17 W              | 13 W              |

Specifications subject to change without notice or obligation.

# ENHANCED DISPLAYS LINE-UP

Last Update: 2018 May 8

## SPECIFICATIONS

|                                | 10.4"             |                    | 12.1"             |                   |                   |                  |
|--------------------------------|-------------------|--------------------|-------------------|-------------------|-------------------|------------------|
| <b>Part Number</b>             | 90-4104-020       | 90-4104-021        | 90-4121-001       | 90-4121-002       | 90-4121-003       | 90-4121-004      |
| <b>Status</b>                  | In Production     | In Production      | In Production     | In Production     | In Production     | In Production    |
| <b>Resolution</b>              | 1024 x 768        | 1024 x 768         | 1024 x 768        | 1024 x 768        | 1024 x 768        | 1024 x 768       |
| <b>Brightness @ Rail Temp.</b> | 1950 nits @ 70°C  | 3950 nits @ 60°C   | 2100 Nits @ 50°C  | 1700 Nits @ 50°C  | 1700 Nits @ 50°C  | 1650 Nits @ 70°C |
| <b>Contrast Ratio</b>          | 1250:1            | 850:1              | 950:1             | 850:1             | 850:1             | 700:1            |
| <b>Weber Class</b>             | 6                 | 6                  | 5                 | 5                 | 5                 | 6                |
| <b>Display Mode</b>            | SR/NVIS           | SR/NVIS            | SR                | SR/NVIS           | SR                | SR/NVIS          |
| <b>Colors</b>                  | 6-bit/6-bit + FRC | 6-bit/8-bit        | 6-bit/6-bit + FRC | 6-bit/6-bit + FRC | 6-bit/6-bit + FRC | 6-bit/8-bit      |
| <b>Response Time</b>           | 25 ms             | 16 ms              | 5/11 ms           | 5/11 ms           | 5/11 ms           | 35 ms            |
| <b>Viewing Angle</b>           | ±88° H/±85° V     | ±75° H/+60, -70° V | ±80° H/±70° V     | ±80° H/±70° V     | ±80° H/±70° V     | ±80°/±80°        |
| <b>NTSC</b>                    | 70%               | 50%                | 63%               | 63%               | 63%               | 76%              |
| <b>Technology</b>              | ADS               | TN                 | α-Si TFT          | α-Si TFT          | α-Si TFT          | Si TFT           |
| <b>Operating Temperature</b>   | -45°C to 85°C     | -20°C to 70°C      | -30°C to 70°C     | -30°C to 80°C     | -30°C to 80°C     | -30°C to 85°C    |
| <b>Storage Temperature</b>     | -55°C to 85°C     | -30°C to 80°C      | -40°C to 80°C     | -40°C to 85°C     | -40°C to 85°C     | -30°C to 85°C    |
| <b>Backlight Power</b>         | 17 W              | 11 W               | 12 W              | 14 W              | 14 W              | 10.5 W           |

Specifications subject to change without notice or obligation.

# ENHANCED DISPLAYS LINE-UP

Last Update: 2018 May 8

## SPECIFICATIONS

|                                | 15.0"           |                    |                    | 15.6"            |                   | 17.0"             |                 |
|--------------------------------|-----------------|--------------------|--------------------|------------------|-------------------|-------------------|-----------------|
| <b>Part Number</b>             | 90-4150-010     | 90-4150-011        | 90-4150-012        | 90-4156-002      | 90-4156-003       | 90-4170-005       | 90-4170-006     |
| <b>Status</b>                  | In Production   | In Production      | In Production      | In Production    | In Production     | In Production     | In Production   |
| <b>Resolution</b>              | 1024 x 768      | 1024 x 768         | 1024 x 768         | 1920 x 1080      | 1920 x 1080       | 1280 x 1024       | 1280 x 1024     |
| <b>Brightness @ Rail Temp.</b> | 900 nits @ 50°C | 1350 nits @ 50°C   | 1350 nits @ 50°C   | 1350 nits @ 55°C | 1300 nits @ 55°C  | 950 nits @ 50°C   | 950 nits @ 50°C |
| <b>Contrast Ratio</b>          | 1150:1          | 1100:1             | 1100:1             | 650:1            | 500:1             | 800:1             | 800:1           |
| <b>Weber Class</b>             | 5               | 4                  | 4                  | 5                | 5                 | 5                 | 5               |
| <b>Display Mode</b>            | SR/NVIS         | SR                 | SR/NVIS            | SR               | SR/NVIS           | SR/NVIS           | SR              |
| <b>Colors</b>                  | 6-bit/8-bit     | 6-bit/6-bit + FRC  | 6-bit/6-bit + FRC  | 8-bit            | 6-bit/6-bit + FRC | 6-bit/6-bit + FRC | 6-bit/8-bit     |
| <b>Response Time</b>           | 3/5 ms          | 5.7/2.3 ms         | 5.7/2.3 ms         | 8 ms             | 8 ms              | 5.7/2.3 ms        | 5.7/2.3 ms      |
| <b>Viewing Angle</b>           | ±80° H/±80° V   | ±80° H/+60, -80° V | ±80° H/+60, -80° V | ±80° H/±70° V    | ±70° H/±60° V     | ±85° H/±80° V     | ±85° H/±80° V   |
| <b>NTSC</b>                    | 60%             | 60%                | 60%                | 74%              | 75%               | 60%               | 60%             |
| <b>Technology</b>              | TN              | TN                 | ADS                | Si TFT           | Si TFT            | TN                | TN              |
| <b>Operating Temperature</b>   | -20°C to 70°C   | -30°C to 85°C      | -30°C to 85°C      | -10°C to 70°C    | -10°C to 70°C     | -30°C to 85°C     | -30°C to 85°C   |
| <b>Storage Temperature</b>     | -30°C to 80°C   | -30°C to 85°C      | -30°C to 85°C      | -20°C to 70°C    | -20°C to 70°C     | -30°C to 85°C     | -30°C to 85°C   |
| <b>Backlight Power</b>         | 13 W            | 13 W               | 13 W               | 18 W             | 18 W              | 22 W              | 22 W            |

Specifications subject to change without notice or obligation.

# ENHANCED DISPLAYS LINE-UP

Last Update: 2018 May 8

## SPECIFICATIONS

|                                | 17.3"              | 18.5"          | 19.0"            |                 |                  |                 | 20.1"           |
|--------------------------------|--------------------|----------------|------------------|-----------------|------------------|-----------------|-----------------|
| <b>Part Number</b>             | 90-4173-001        | 90-4185-001    | 90-4190-009      | 90-4190-010     | 90-4190-013      | 90-9190-004     | 90-4201-007     |
| <b>Status</b>                  | In Production      | In Development | In Production    | In Production   | In Production    | In Production   | In Production   |
| <b>Resolution</b>              | 1920 x 1080        | 1920 x 1080    | 1280 x 1024      | 1280 x 1024     | 1280 x 1024      | 1280 x 1024     | 1600 x 1200     |
| <b>Brightness @ Rail Temp.</b> | 950 nits @ 55°C    | N/A            | 1550 nits @ 50°C | 950 nits @ 50°C | 1300 nits @ 60°C | 500 nits @ 40°C | 550 nits @ 50°C |
| <b>Contrast Ratio</b>          | 900:1              | N/A            | 1000:1           | N/A             | 1150:1           | 900:1           | 1200:1          |
| <b>Weber Class</b>             | 5                  | N/A            | 5                | 5               | 6                | 5               | 4               |
| <b>Display Mode</b>            | SR/NVIS            | SR/NVIS        | SR               | SR/NVIS         | SR/NVIS          | SR              | STD/NVIS        |
| <b>Colors</b>                  | 8-bit              | N/A            | 6-bit + FRC      | 6-bit + FRC     | 6-bit + FRC      | 6-bit + FRC     | 8-bit           |
| <b>Response Time</b>           | 37/3 ms            | N/A            | 3.6/1.4 ms       | 3.6/1.4 ms      | 7/3 ms           | 7/3 ms          | 30 ms           |
| <b>Viewing Angle</b>           | ±80° H/+60, -80° V | N/A            | ±85° H/±80° V    | ±85° H/±80° V   | ±85° H/±80° V    | ±85° H/±80° V   | ±85° H/±85° V   |
| <b>NTSC</b>                    | 78%                | N/A            | 72%              | 72%             | 75%              | 90%             | 71%             |
| <b>Technology</b>              | α-Si LCM           | N/A            | TN               | TN              | Si TFT           | Si TFT          | VA              |
| <b>Operating Temperature</b>   | 0°C to 70°C        | N/A            | 0°C to 50°C      | 0°C to 50°C     | -30°C to 85°C    | -30°C to 85°C   | 0°C to 60°C     |
| <b>Storage Temperature</b>     | -30°C to 75°C      | N/A            | -20°C to 60°C    | -20°C to 60°C   | -30°C to 85°C    | -30°C to 85°C   | -25°C to 60°C   |
| <b>Backlight Power</b>         | 22 W               | N/A            | 22 W             | 17 W            | 29 W             | 15 W            | 23 W            |

Specifications subject to change without notice or obligation.

# ENHANCED DISPLAYS LINE-UP

Last Update: 2018 May 8

## SPECIFICATIONS

|                                | 21.3"            |                  |                  | 21.5"           |                  | 24.0"           |                 |
|--------------------------------|------------------|------------------|------------------|-----------------|------------------|-----------------|-----------------|
| <b>Part Number</b>             | 90-4213-002      | 90-4213-003      | 90-4213-004      | 90-4215-003     | 90-4215-006      | 90-4240-002     | 90-4240-003     |
| <b>Status</b>                  | In Production    | In Production    | In Production    | In Production   | In Production    | In Production   | In Production   |
| <b>Resolution</b>              | 1600 x 1200      | 1600 x 1200      | 1600 x 1200      | 1920 x 1080     | 1920 x 1080      | 1920 x 1080     | 1920 x 1080     |
| <b>Brightness @ Rail Temp.</b> | 1200 nits @ 50°C | 1950 nits @ 50°C | 1200 nits @ 50°C | 850 nits @ 50°C | 1050 nits @ 50°C | 750 nits @ 45°C | 900 nits @ 50°C |
| <b>Contrast Ratio</b>          | 1300:1           | 1200:1           | 1300:1           | 3450:1          | 7450:1           | 4200:1          | 3350:1          |
| <b>Weber Class</b>             | 5                | 6                | 6                | 5               | 6                | 6               | 2               |
| <b>Display Mode</b>            | SR/NVIS          | SR               | SR               | SR/NVIS         | SR               | SR/NVIS         | SR/NVIS         |
| <b>Colors</b>                  | 8-bit            | 8-bit            | 8-bit            | 8-bit           | 8-bit            | 8-bit           | 8-bit           |
| <b>Response Time</b>           | 40 ms            | 40 ms            | 15/15 ms         | 20/5 ms         | 20/5 ms          | 16/9 ms         | 16/9 ms         |
| <b>Viewing Angle</b>           | ±88° H/±88° V    | ±88° H/±88° V    | ±89° H/±89° V    | ±89° H/±89° V   | ±89° H/±89° V    | ±89° H/±89° V   | ±88° H/±88° V   |
| <b>NTSC</b>                    | 72%              | 72%              | N/A              | 75%             | 75%              | 77%             | 72%             |
| <b>Technology</b>              | UA-SFT           | UA-SFT           | α-Si TFT         | AMVA3           | AMVA3            | α-Si LCM        | AMVA3           |
| <b>Operating Temperature</b>   | 0°C to 60°C      | 0°C to 60°C      | 0°C to 50°C      | 0°C to 50°C     | 0°C to 50°C      | -20°C to 70°C   | 0°C to 50°C     |
| <b>Storage Temperature</b>     | -20°C to 60°C    | -20°C to 60°C    | -20°C to 60°C    | -20°C to 60°C   | -20°C to 60°C    | -30°C to 80°C   | -20°C to 60°C   |
| <b>Backlight Power</b>         | 63 W             | 80 W             | 25 W             | 29 W            | 29 W             | 28 W            | 32 W            |

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# ENHANCED DISPLAYS LINE-UP

Last Update: 2018 May 8

## What is Weber Contrast?

Weber contrast is an important attribute to consider when selecting a display for use in high ambient brightness environments. Unlike the standard contrast value, which is measured in ideal conditions (dark room), the Weber contrast is measured under the simulated effects of direct sunlight

(10,000 fc direct and 2,000 fL Lambertian light sources). General Digital determines and records the Weber contrast using the test procedure described in MIL-L-85762A. To simplify and quantify the engineering challenge of qualifying a panel for use in high ambient brightness

conditions, we created our own unique metric (Weber Class), which is derived directly from Table II of MIL-L-85762A. This data establishes that the larger the Weber Class number, the better the display will perform in high ambient brightness conditions.

WEBER CONTRAST LOOKUP CHART

| Display Class | Contrast Range  | Short Description                 | Ideal Applications   |
|---------------|-----------------|-----------------------------------|--|
| Class 1       | 0.00 to 1.49    | Not sunlight readable             | Not suitable for direct sunlight use   |
| Class 2       | 1.50 to 1.99    | Numeric ONLY                      | Useful for numerics only in direct sunlight  |
| Class 3       | 2.00 to 2.99    | Alphanumeric                      | Useful for characters and numerical data   |
| Class 4       | 3.00 to 4.659   | Graphic symbols and alphanumerics | Useful for characters, numerical data and static images  |
| Class 5       | 4.66 to 10.29   | Acceptable video performance      | Useful for characters, numerical data, static images and low quality video (6 $\sqrt{2}$ shades of gray with counting off as 1)              |
| Class 6       | 10.3 and higher | Best case video performance       | Useful for characters, numerical data, static images and high quality video (eight or more $\sqrt{2}$ shades of gray with counting off as 1) |