Agilent Technologies
Innovating the HP Way

8 x 8 Rich Color General Purpose Dot Matrix Displays 47.8 mm (1.88 inch) Package

Technical Data

HDSP-R881
HDSP-R883

Features

- **8 x 8 Dot Matrix**
  Dot Diameter 3.75 mm
  Dot Pitch 6.0 mm
- **Rich Color Capability**
  Mix Colors Red, Blue, and Green for Rich Colors including White
- **Viewable up to 30 Meters**
- **X-Y Stackable**
- **Industry Standard Pin-out**
  36.0 mm (1.4 in.) DIP Leads on 2.54 mm (0.1 in.) Centers
- **Black Face Paint**

Description

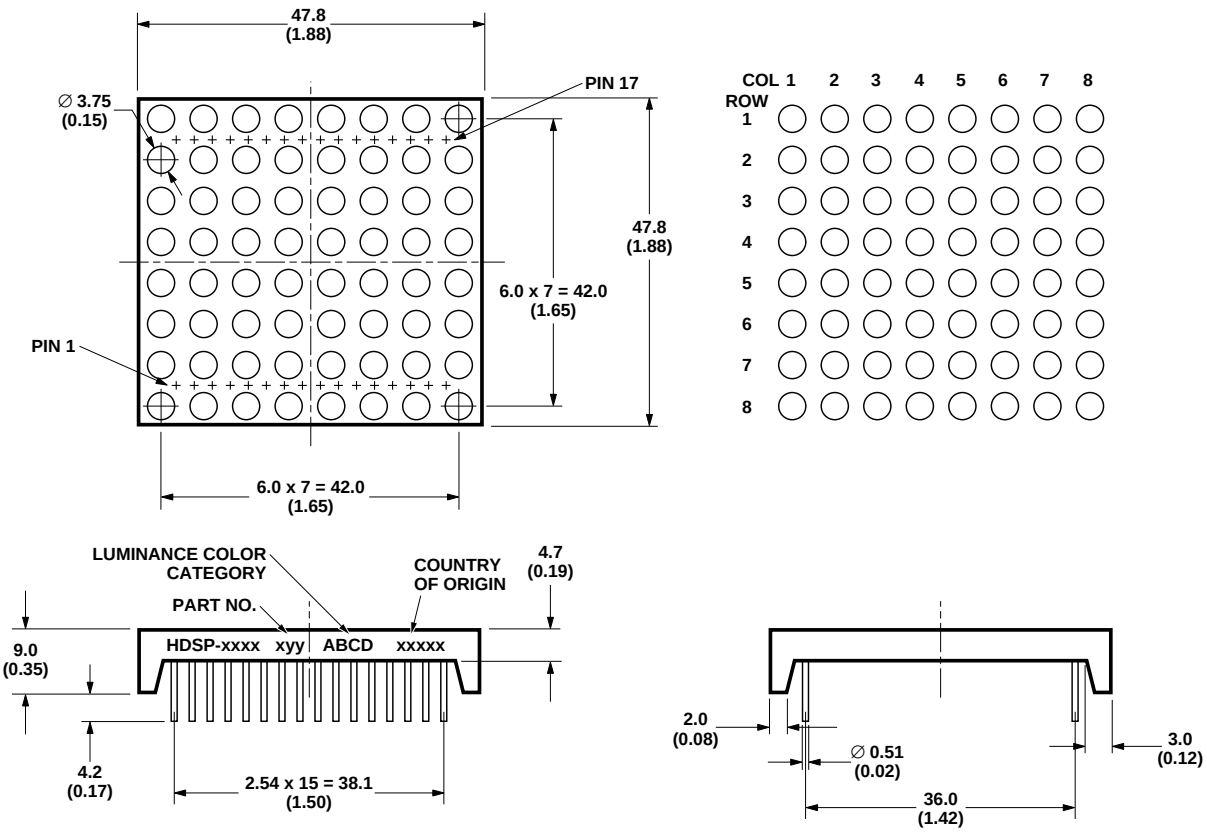
This display comprises 8 rows by 8 columns of 3.75 mm diameter dots on a pitch of 6.0 mm. The device is available in common row cathode and common row anode configurations. The displays come in black face paint and black side-walls. Each dot has red, green, and blue (RGB) colors that may be mixed to produce the intended rich color. Water clear dots provide for higher intensities for the display.

Devices

	Description
HDSP-R881	Common Row Anode
HDSP-R883	Common Row Cathode

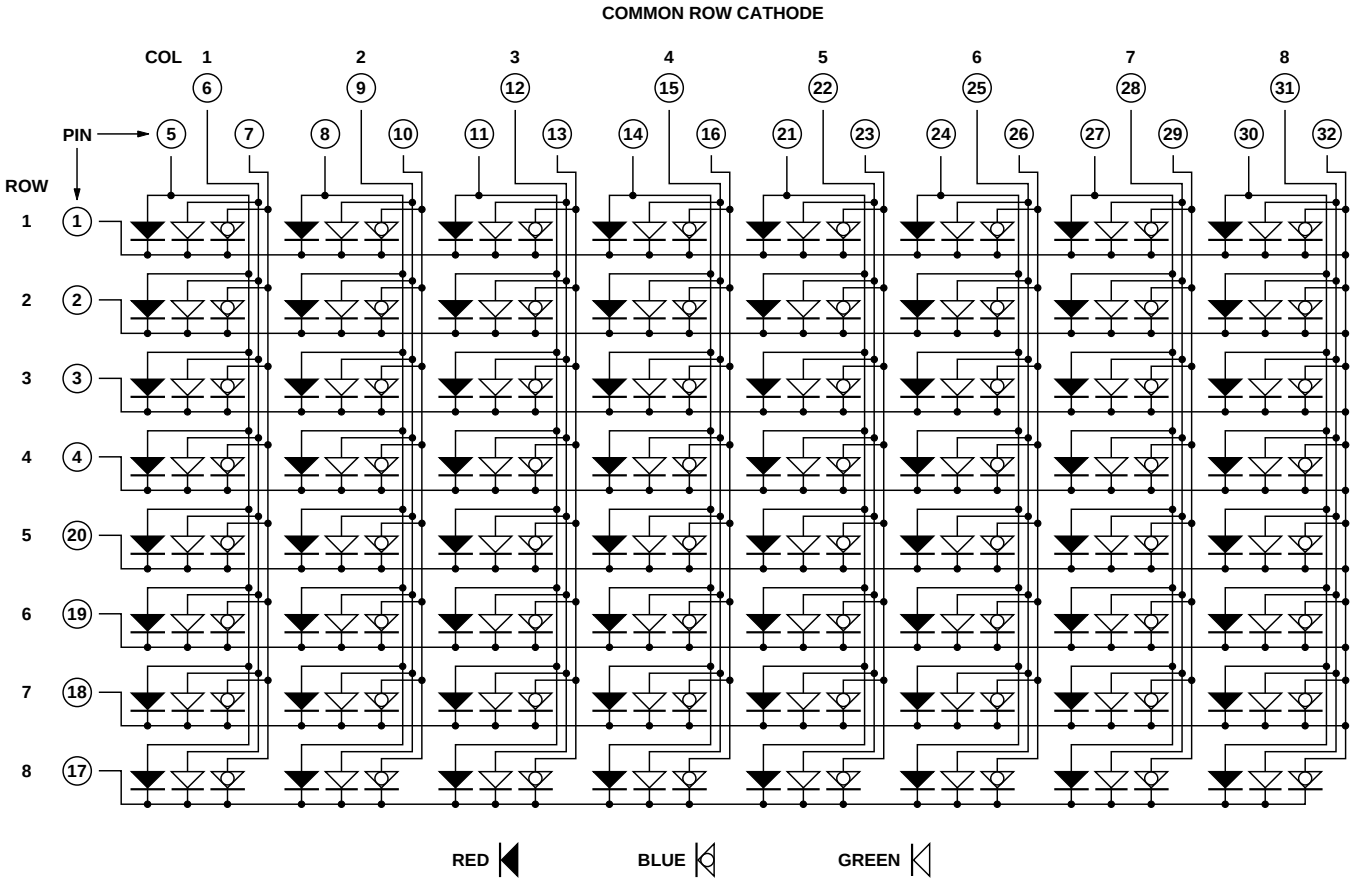
Note:
1. For details, please contact your local Agilent components sales office or an authorized distributor.

Package Dimensions



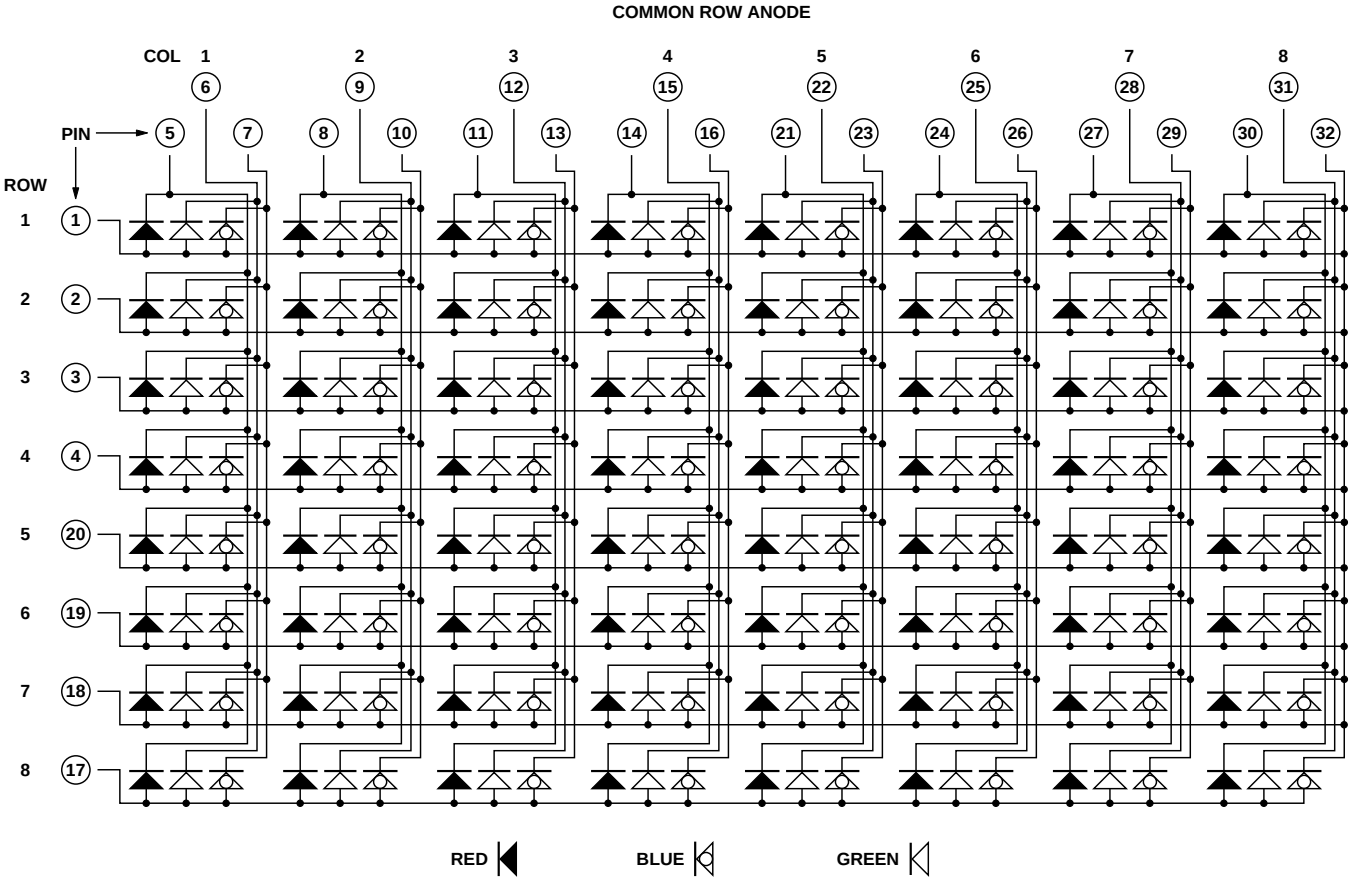
NOTES:
1. UNLESS OTHERWISE STATED, TOLERANCE IS ± 0.25 mm.
2. DIMENSIONS IN MILLIMETERS (INCHES).

Internal Circuit Diagram



PIN	FUNCTION	PIN	FUNCTION
1	ROW 1 CATHODE	17	ROW 8 CATHODE
2	ROW 2 CATHODE	18	ROW 7 CATHODE
3	ROW 3 CATHODE	19	ROW 6 CATHODE
4	ROW 4 CATHODE	20	ROW 5 CATHODE
5	COLUMN 1 RED ANODE	21	COLUMN 5 RED ANODE
6	COLUMN 1 GREEN ANODE	22	COLUMN 5 GREEN ANODE
7	COLUMN 1 BLUE ANODE	23	COLUMN 5 BLUE ANODE
8	COLUMN 2 RED ANODE	24	COLUMN 6 RED ANODE
9	COLUMN 2 GREEN ANODE	25	COLUMN 6 GREEN ANODE
10	COLUMN 2 BLUE ANODE	26	COLUMN 6 BLUE ANODE
11	COLUMN 3 RED ANODE	27	COLUMN 7 RED ANODE
12	COLUMN 3 GREEN ANODE	28	COLUMN 7 GREEN ANODE
13	COLUMN 3 BLUE ANODE	29	COLUMN 7 BLUE ANODE
14	COLUMN 4 RED ANODE	30	COLUMN 8 RED ANODE
15	COLUMN 4 GREEN ANODE	31	COLUMN 8 GREEN ANODE
16	COLUMN 4 BLUE ANODE	32	COLUMN 8 BLUE ANODE

Internal Circuit Diagram



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16	COLUMN 4 BLUE CATHODE	32	COLUMN 8 BLUE CATHODE

Absolute Maximum Ratings at T_A=25°C

Parameter	Symbol	Red	Green	Blue	Units
Power Dissipation per Dot	P_D	30	39	90	mW
Peak Forward Current per Dot[1,2]	I_{PEAK}	60	100	50	mA
Average Forward Current per Dot	I_F AVG	15[3]	15[4]	20[5]	mA
Reverse Voltage per Dot	V_R	5	5	5	V
Operating Temperature	T_O	–35 to 80			°C
Storage Temperature	T_S	–40 to 80			°C
Soldering Conditions	Temperature	260			°C
(2 mm [0.079 in.] Below Seating Plane)	Time	3			s

Notes:
1. Do not exceed maximum average current per dot.
2. Maximum peak forward current stated at 1/8 duty factor, 10 kHz.
3. Derate above 25°C at 0.20 mA/°C for red color.
4. Derate above 25°C at 0.17 mA/°C for green color.
5. Derate above 25°C at 0.33 mA/°C for blue color.

Optical/Electrical Characteristics at T_A=25°C

Parameter	Symbol	Color	Min.	Typ.	Max.	Units	Test Conditions
Peak Wavelength	λ_{PEAK}	Red		660		nm	I_F = 20 mA
		Green		568			
		Blue		430			
Dominant Wavelength	λ_d	Red		643		nm	I_F = 20 mA
		Green		573			
		Blue		466			
Spectral Line Half Width	λ_d	Red		20		nm	I_F = 20 mA
		Green		30			
		Blue		65			
Forward Voltage	V_F	Red		1.8	2.0	V	I_F = 20 mA
		Green		2.2	2.6		
		Blue		3.8	4.5		
Reverse Current[1]	I_R	Red			100	µA	V_R = 5 V
		Green			100		
		Blue			100		

Note:
1. Typical specification for reference only. Do not exceed absolute maximum ratings.

Luminance and Color at T_A=25°C

Color	Color Combination	Luminance cd/m² (nits)			Color Coordinates[2]	
		Min.	Typ.	Max.	X	Y
Red	Red	175	226		0.728	0.271
Green	Green	280	366		0.488	0.546
Blue	Blue	30	49		0.146	0.055
Orange	Red, Green	455	592		0.594	0.403
Purple	Red, Blue	205	275		0.412	0.152
White	Green, Blue	310	415		0.285	0.270
Pink	Red, Green, Blue	485	641		0.420	0.280
Test Conditions[3]: At 1/8 Duty, Red I_{FP} = 40 mA, Green I_{FP} = 80 mA, Blue I_{FP} = 40 mA						

Notes:
1. The devices are categorized for luminous intensity. The intensity category is designated by a letter on the side of the package.
2. Color coordinates are based on the CIE 1931 Chromaticity Coordinates. See Figure 10.
3. Test current for each color is applied to individual colors per color combination.

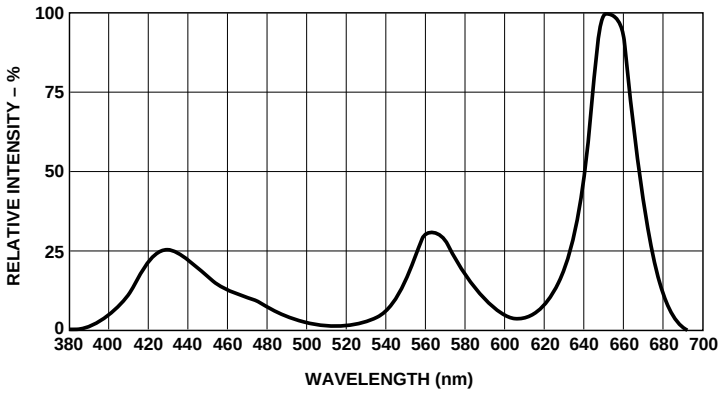

Figure 1. Relative Intensity vs. Wavelength.

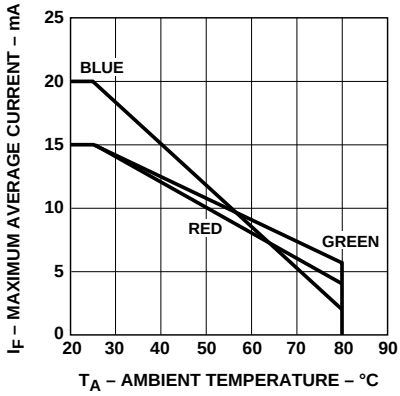

Figure 2. Maximum Allowable Average Current per Dot vs. Ambient Temperature.

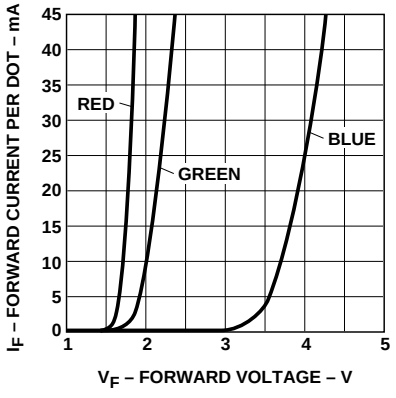

Figure 3. Forward Current vs. Forward Voltage.

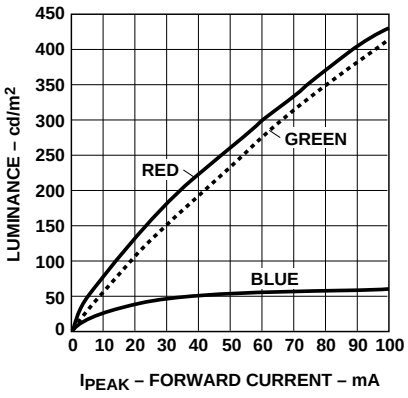

Figure 4. Relative Luminance vs. Peak Forward Current.

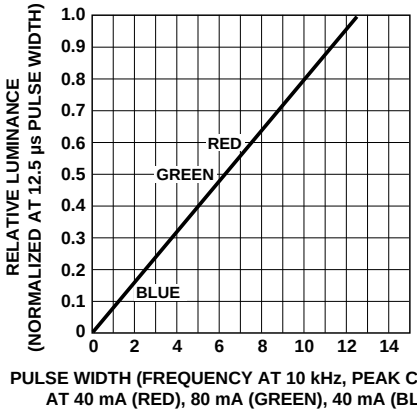

Figure 5. Relative Luminance vs. Duty Factor.

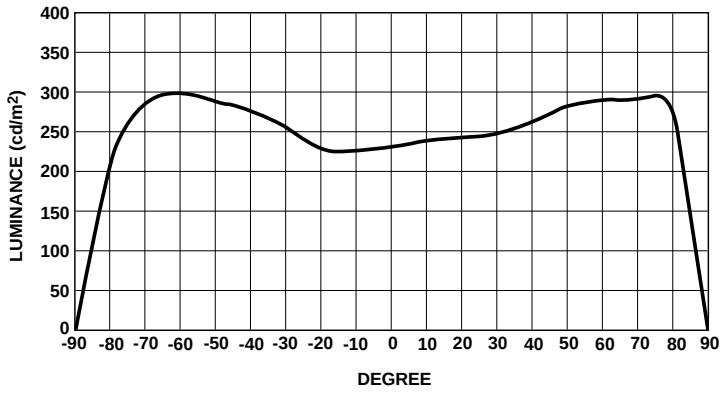

Figure 6. Typical Luminance vs. Angular Displacement (Red).

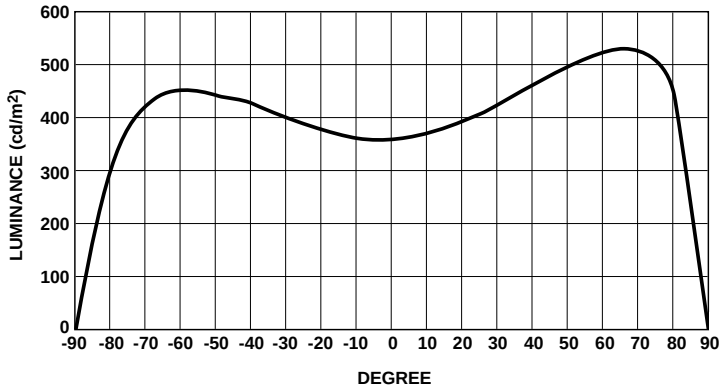

Figure 7. Typical Luminance vs. Angular Displacement (Green).

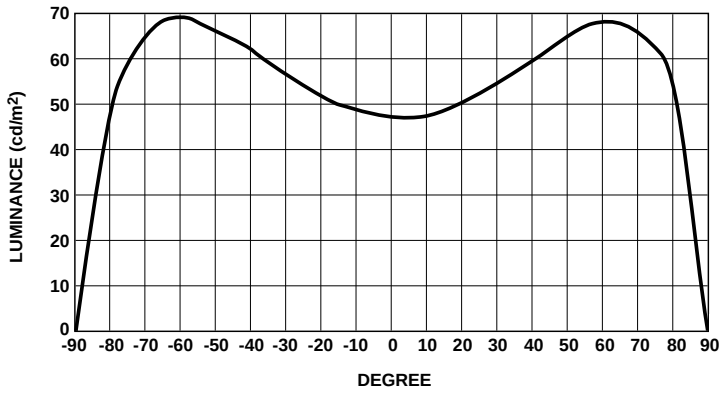

Figure 8. Typical Luminance vs. Angular Displacement (Blue).

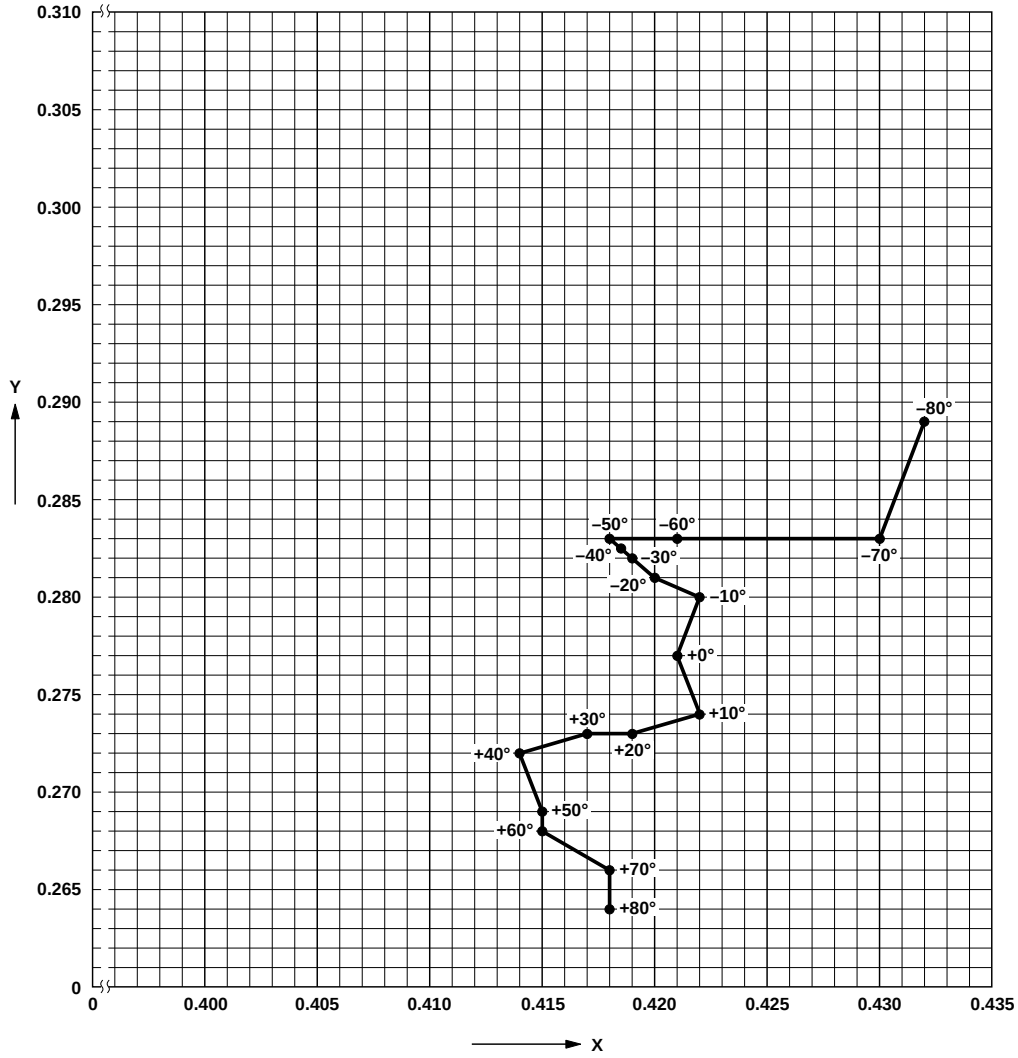

Figure 9. CIE Color Coordinates vs. Angular Displacement (Pink).

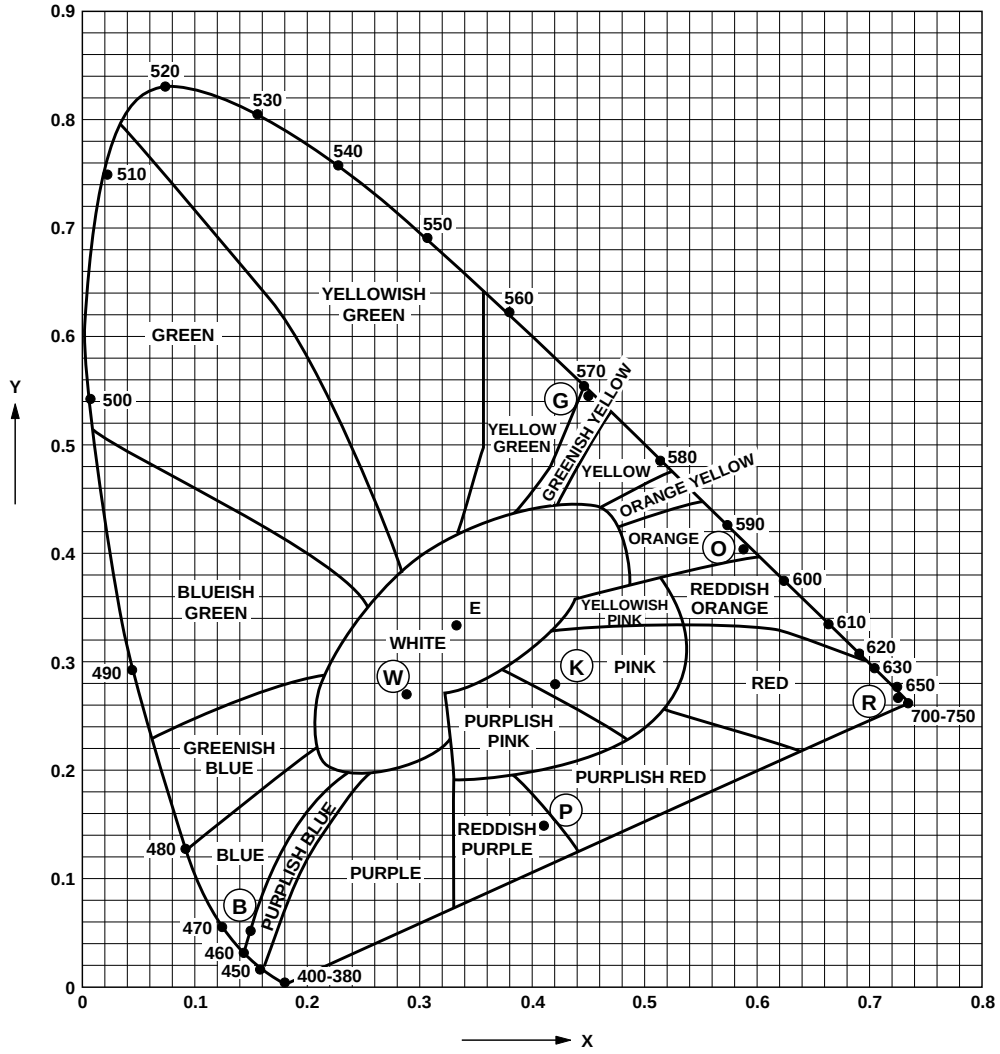

Figure 10. CIE 1931 Chromaticity Diagram.

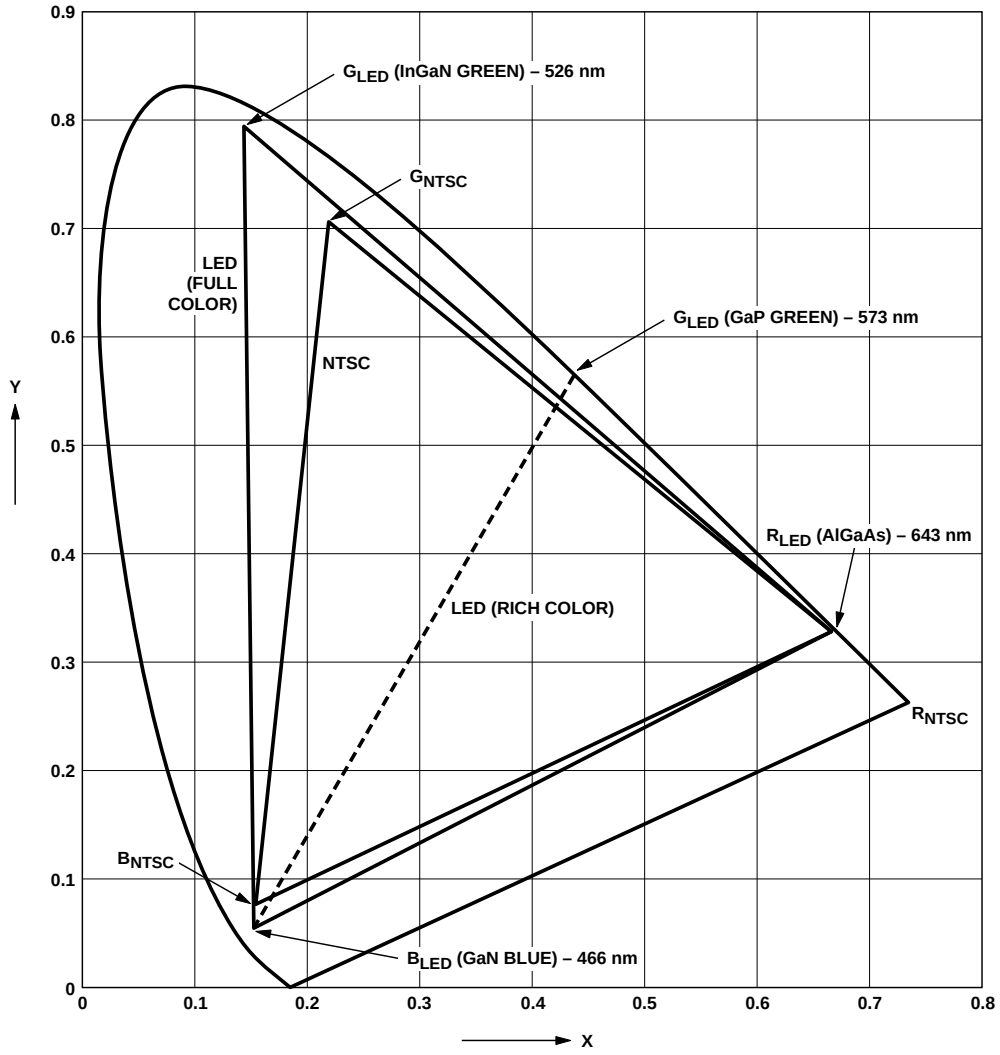

Figure 11. Color Coordinate (NTSC vs. LED).

Contrast Enhancement

For information on contrast enhancement, please see Application Note 1015.

Soldering/Cleaning

Cleaning agents from the ketone family (acetone, methyl ethyl ketone, etc.) and from the chlorinated hydrocarbon family (methylene chloride, trichloro-ethylene, carbon tetrachloride, etc.) are not recommended for cleaning LED parts. All of these various solvents attack or dissolve the encapsulating epoxies used to form the package of plastic LED parts.

For information on soldering LEDs please refer to Application Note 1027.

Device Reliability

For reliability information, please see the reliability data sheet 8 x 8 Rich Color General Purpose Dot Matrix Displays.

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Data subject to change.

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