Agilent HDSP-331x/332E/333x/334x Series 7.62 mm (0.3 inch) General Purpose Seven-Segment Display

Data Sheet

Features

- **Industry standard size**
- **Industry standard pinout**
  7.62 mm (0.4 inch) character height
  DIP lead on 2.54 mm
- **Choice of colors**
  High Efficiency Red (HER), Green, AlGaAs Red, and Yellow
- **Excellent appearance**
  Evenly lighted segments gray package gives optimum contrast
  ± 50° viewing angle
- **Design flexibility**
  Common anode or common cathode
  Single digit
  Left and right hand decimal point
- **Categorized for luminous intensity**
  Green and yellow categorized for color

Description

This 7.62 mm (0.3 inch) LED seven-segment display uses industry standard size package and pinout. The device is available in either common anode or common cathode. The choice of colors includes High Efficiency Red (HER), Green, AlGaAs Red, and Yellow. The gray face displays are suitable for indoor use.

Applications

- **Suitable for indoor use**
- **Not recommended for industrial application, i.e., operating temperature requirements exceeding +85°C or below –25°C**[1]
- **Extreme temperature cycling not recommended**

Note:

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

Devices

HER	Green	AlGaAs Red	Yellow	Description	Package Drawing
HDSP-331E	HDSP-331G	HDSP-331A	HDSP-331Y	Common Anode, Right Hand and Left Hand Decimal	A
HDSP-332E				Common Anode, Right Hand and Left Hand Decimal without Pin 4, 5 and 12	A
HDSP-333E	HDSP-333G	HDSP-333A	HDSP-333Y	Common Cathode, Right Hand Decimal	B
HDSP-334E	HDSP-334G	HDSP-334A	HDSP-334Y	Common Cathode, Right Hand Decimal	C

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Part Numbering System

5082 -X X X X-X X X X X

HDSP-X X X X-X X X X X

Mechanical Options[1]
00: No Mechanical Option

Color Bin Options[1,2]
0: No Color Bin Limitation

Maximum Intensity Bin[1,2]
0: No Maximum Intensity Bin Limitation

Minimum Intensity Bin[1,2]
0: No Minimum Intensity Bin Limitation

Device Configuration/Color[1]
A: AlGaAs Red
E: High Efficiency Red
G: Green
Y: Yellow

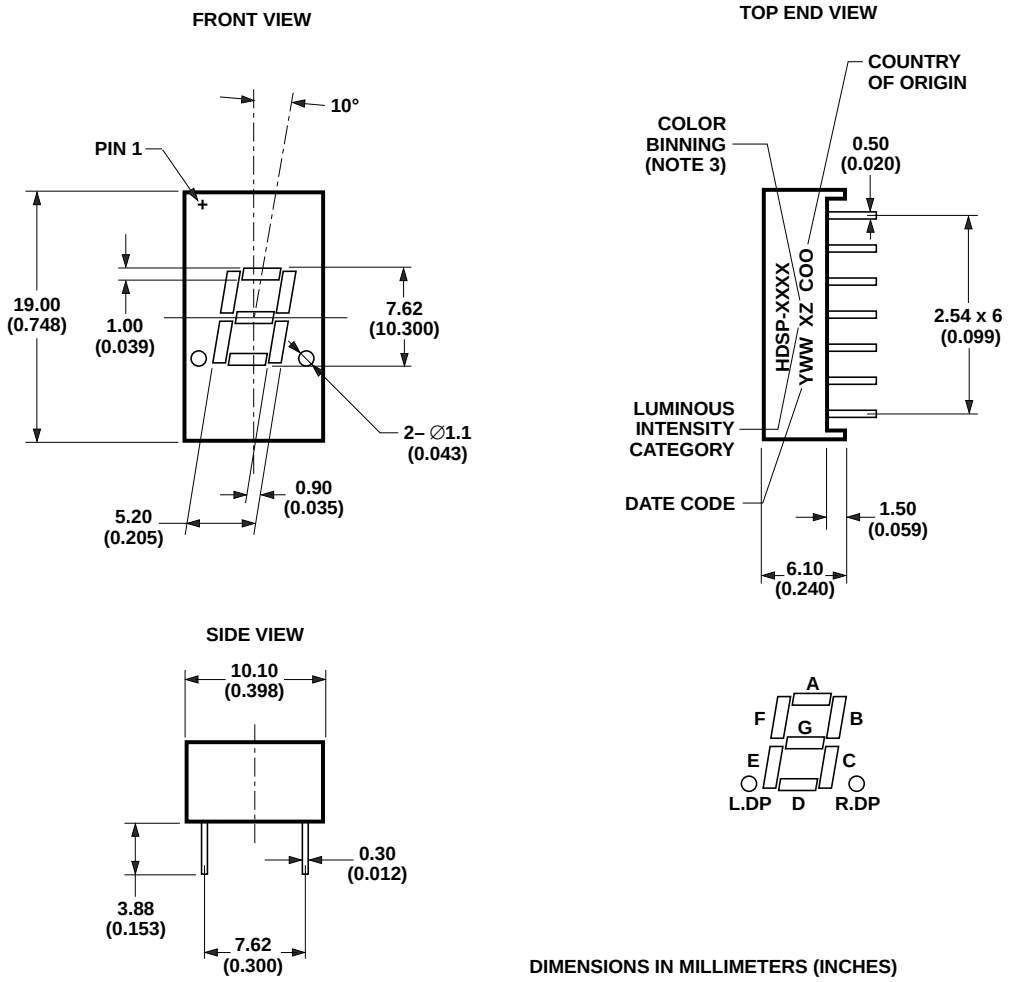
Device Specific Configuration[1]
Refer to Respective Datasheet

Package[1]
Refer to Respective Datasheet

Notes:
1. For codes not listed in the figure above, please refer to the respective datasheet or contact your nearest Agilent representative for details.
2. Bin options refer to shippable bins for a part number. Color and Intensity Bins are typically restricted to 1 bin per tube (exceptions may apply). Please refer to respective datasheet for specific bin limit information.

Package Dimensions

Package Drawing A

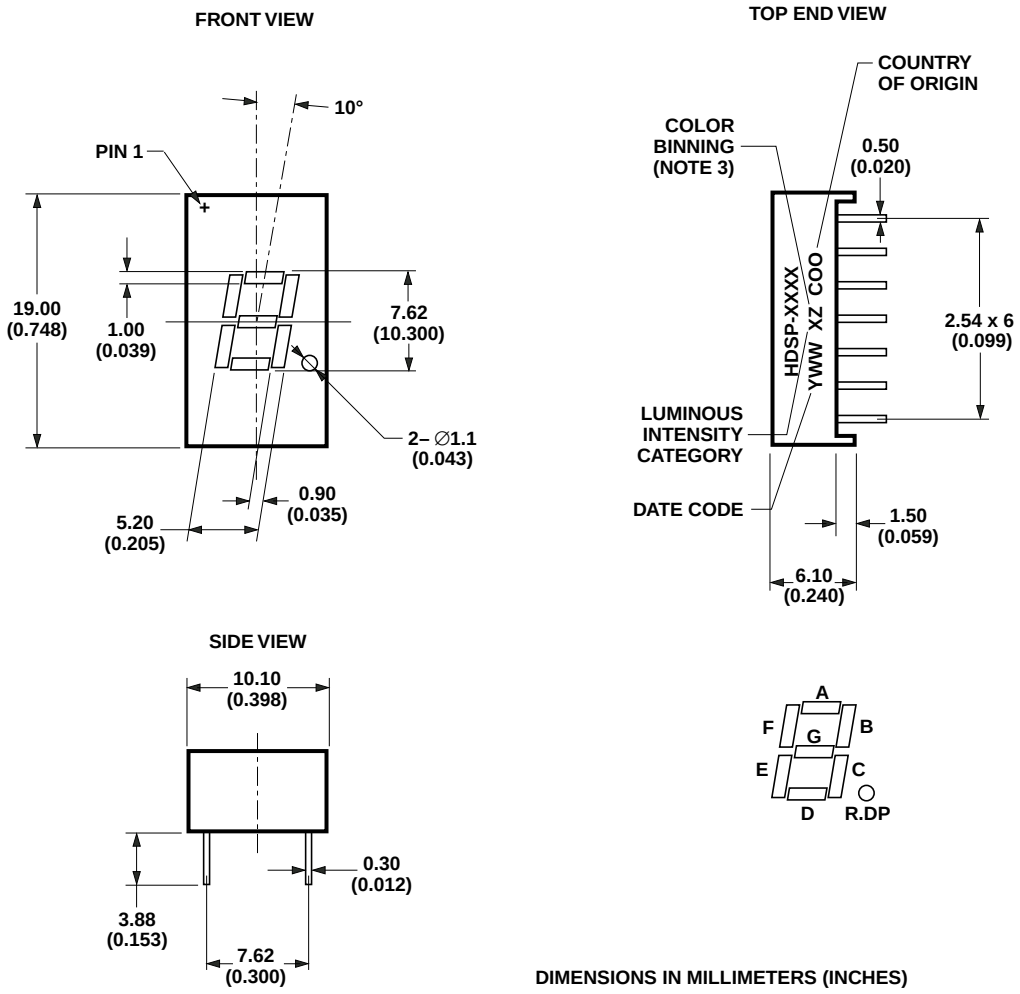


DIMENSIONS IN MILLIMETERS (INCHES)

NOTE: HDSP-332E DOES NOT HAVE PIN 4, 5 AND 12.

Package Dimensions

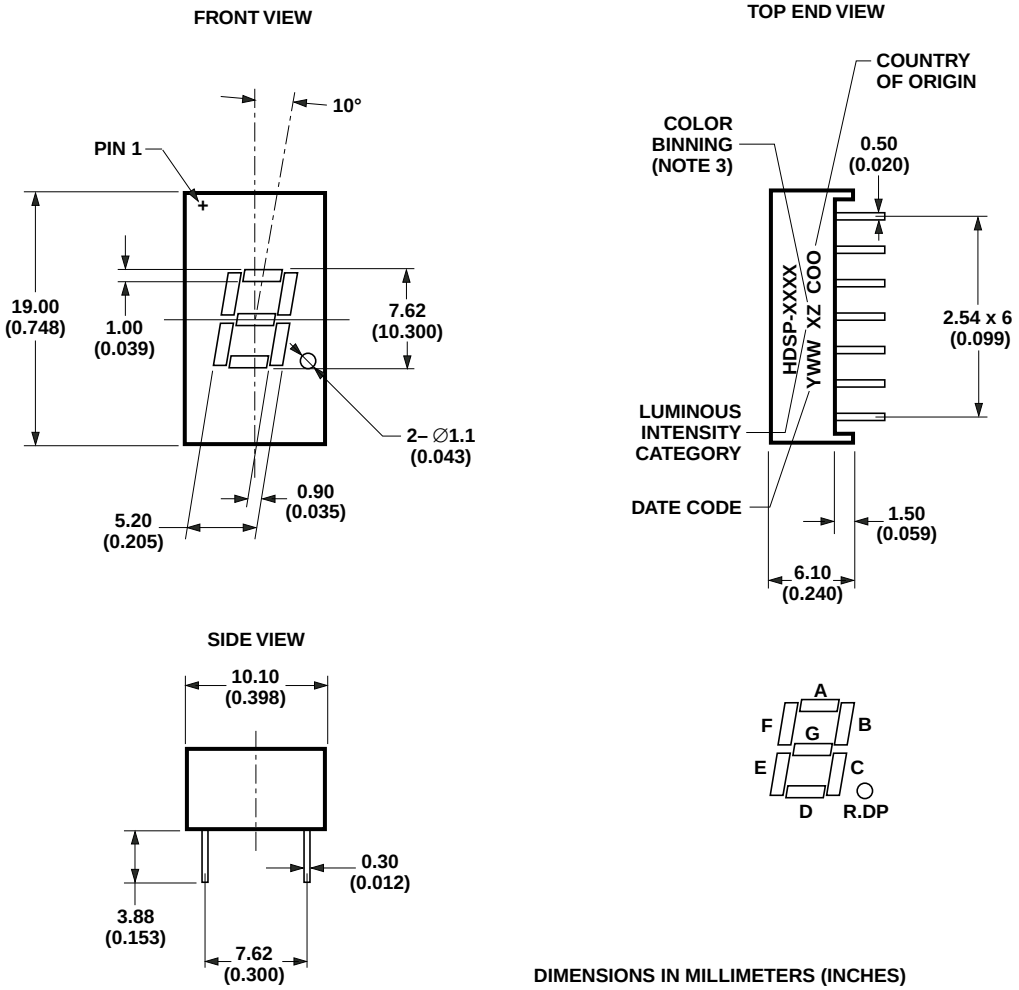
Package Drawing B



DIMENSIONS IN MILLIMETERS (INCHES)

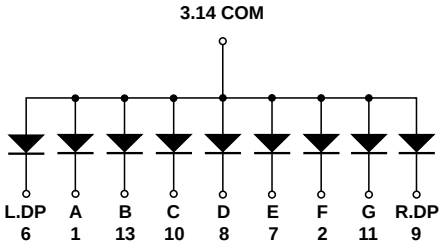
Package Dimensions

Package Drawing C



Internal Circuit Diagram

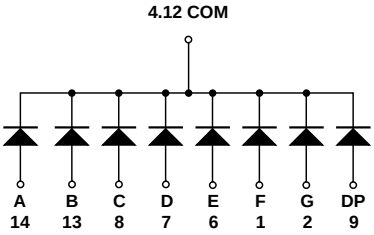
Common Anode



HDSP-331E/331G/331Y/331A/332E

PIN N0.	CONNECTION
1	CATHODE A
2	CATHODE F
3	COMMON ANODE
6	CATHODE L.DP
7	CATHODE E
8	CATHODE D
9	CATHODE R.DP
10	CATHODE C
11	CATHODE G
13	CATHODE B
14	COMMON ANODE
PINS 4, 5, 12: NO CONNECTION FOR HDSP-331E/331G/331Y/331A AND NO PIN FOR HDSP-332E	

Common Cathode

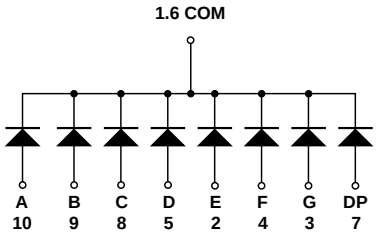


HDSP-333E/333G/333Y/333A

PIN NO.	CONNECTION
1	ANODE F
2	ANODE G
4	COMMON CATHODE
6	ANODE E
7	ANODE D
8	ANODE C
9	ANODE DP
12	COMMON CATHODE
13	ANODE B
14	ANODE A
PINS 3, 5, 10, 11: NC	

Internal Circuit Diagram

Common Cathode



HDSP-334E/334G/334Y/334A

PIN NO.	CONNECTION
1	COMMON CATHODE
2	ANODE E
3	ANODE G
4	ANODE F
5	ANODE D
6	COMMON CATHODE
7	ANODE DP
8	ANODE C
9	ANODE B
10	ANODE A
PINS 11, 12, 13, 14: NC	

Absolute Maximum Ratings at T_A = 25˚C

Description	HER HDSP-33xE	Green HDSP-33xG	AlGaAs Red HDSP-33xA	Yellow HDSP-33xY	Units
Power Dissipation Segment	65	65	30	52	mW
Forward Current Segment	25[1]	25[2]	15[3]	20[4]	mA
Peak Forward Current per Segment (1/10 Duty Factor at 10 kHz)	100	100	80	80	mA
Operating Temperature Range	–35 to +85	–35 to +85	–35 to +85	–35 to +85	˚C
Storage Temperature Range	–35 to +85	–35 to +85	–35 to +85	–35 to +85	˚C
Reverse Voltage per Segment or DP	5	5	5	5	V
Wave Soldering Temperature for 3 Seconds (at 2 mm Distance from the Body)	250	250	250	250	˚C

Notes:
1. Derate above 25˚C at 0.33 mA/˚C.
2. Derate above 25˚C at 0.33 mA/˚C.
3. Derate above 25˚C at 0.2 mA/˚C.
4. Derate above 25˚C at 0.27 mA/˚C.

Electrical/Optical Characteristics at T_A = 25˚C
High Efficiency Red (HER)

Devices HDSP-	Parameter	Symbol	Min.	Typ.	Max.	Units	Test Conditions
331E 332E 333E 334E	Luminous Intensity/Segment	I_V		1.15		mcd	I_F = 5 mA
			0.8	1.80		mcd	I_F = 10 mA
	Forward Voltage	V_F		2.05	2.40	V	I_F = 20 mA
	Peak Wavelength	λ_{PEAK}		635		nm	
	Dominant Wavelength	λ_d		620		nm	
	Reverse Voltage	VR	5			V	I_R = 100 μA

Green

Devices HDSP-	Parameter	Symbol	Min.	Typ.	Max.	Units	Test Conditions
331G 333G 334G	Luminous Intensity/Segment	I_V	0.8	2.00		mcd	I_F = 10 mA
	Forward Voltage	V_F		2.07		V	I_F = 10 mA
			1.80	2.25	2.60	V	I_F = 20 mA
	Peak Wavelength	λ_{PEAK}		568		nm	
	Dominant Wavelength	λ_d		573		nm	
	Reverse Voltage	VR	5			V	I_R = 100 μA

AlGaAs Red

Devices HDSP-	Parameter	Symbol	Min.	Typ.	Max.	Units	Test Conditions
331A 333A 334A	Luminous Intensity/Segment	I_V		3.93		mcd	I_F = 5 mA
			2.001	4.20		mcd	I_F = 10 mA
	Forward Voltage	V_F		1.85	2.00	V	I_F = 20 mA
	Peak Wavelength	λ_{PEAK}		660		nm	
	Dominant Wavelength	λ_d		643		nm	
	Reverse Voltage	VR	5			V	I_R = 100 μA

Yellow

Devices HDSP-	Parameter	Symbol	Min.	Typ.	Max.	Units	Test Conditions
331Y 333Y 334Y	Luminous Intensity/Segment	I_V		0.71		mcd	I_F = 5 mA
			0.80	1.50		mcd	I_F = 10 mA
	Forward Voltage	V_F		2.15	2.60	V	I_F = 20 mA
	Peak Wavelength	λ_{PEAK}		595		nm	
	Dominant Wavelength	λ_d		590		nm	
	Reverse Voltage	VR	5			V	I_R = 100 μA

Intensity Bin Limits (mcd at 10 mA)

	HER/Green/Yellow		AlGaAs Red	
Bin Name	Min.[1]	Max.[1]	Min.[1]	Max.[1]
G	0.801	1.250	NA	NA
H	1.251	2.000	NA	NA
I	2.001	3.200	2.001	3.200
J	NA	NA	3.201	5.050
K	NA	NA	5.051	8.000

Note:
1. Tolerance for each bin limit is ± 10%.

Color Bin Limits (nm at 10 mA)

		Dominant Wavelength (nm)	
Color	Bin	Min.[1]	Max.[1]
Green	3	569.1	571.0
	4	571.1	573.0
	5	573.1	575.0
Yellow	1	585.5	588.5
	2	588.5	591.5
	3	591.5	594.5

Note:
1. Tolerance for each bin limit is 1 nm.

High Efficiency Red (HER)

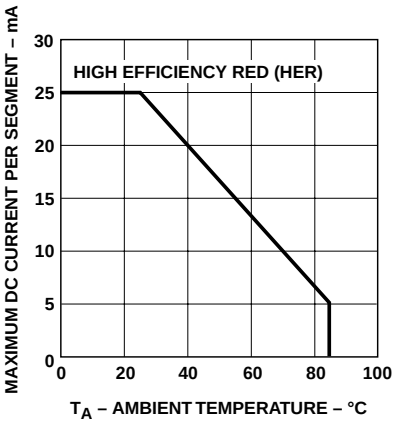


Figure 1. Maximum allowable average or DC current vs. ambient temperature.

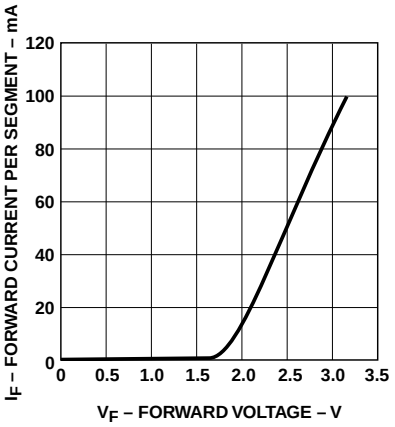


Figure 2. Forward current vs. forward voltage.

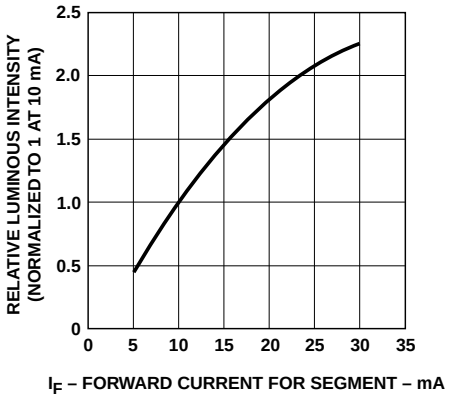


Figure 3. Relative luminous intensity vs. DC forward current.

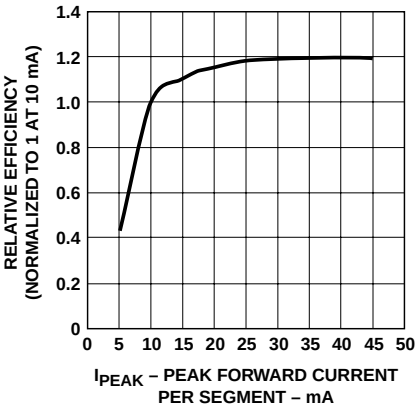


Figure 4. Relative efficiency (luminous intensity per unit current) vs. peak current.

Green

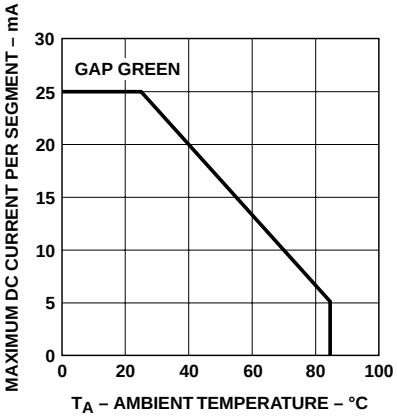


Figure 5. Maximum allowable average or DC current vs. ambient temperature.

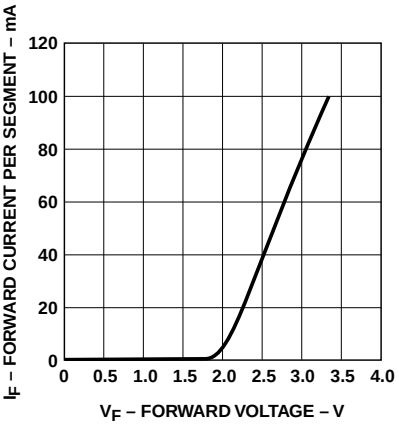


Figure 6. Forward current vs. forward voltage.

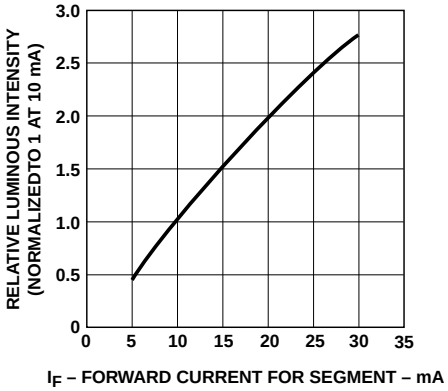


Figure 7. Relative luminous intensity vs. DC forward current.

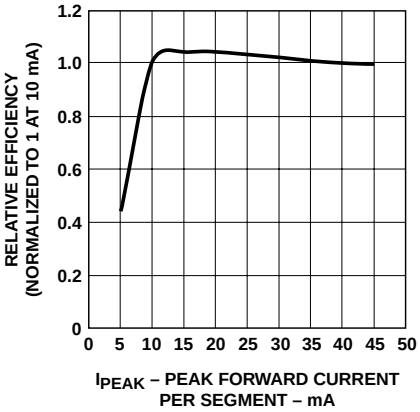


Figure 8. Relative efficiency (luminous intensity per unit current) vs. peak current.

AlGaAs Red

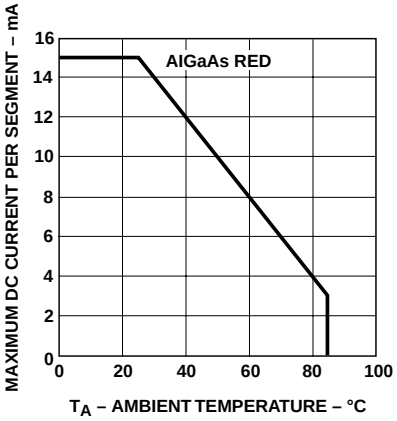


Figure 9. Maximum allowable average or DC current vs. ambient temperature.

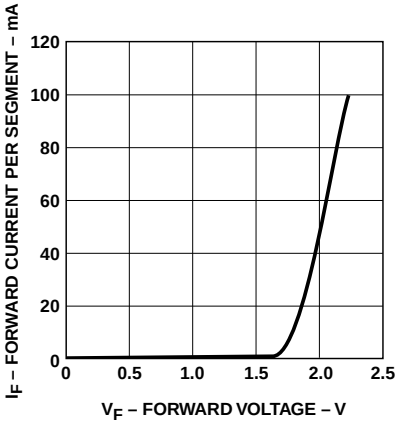


Figure 10. Forward current vs. forward voltage.

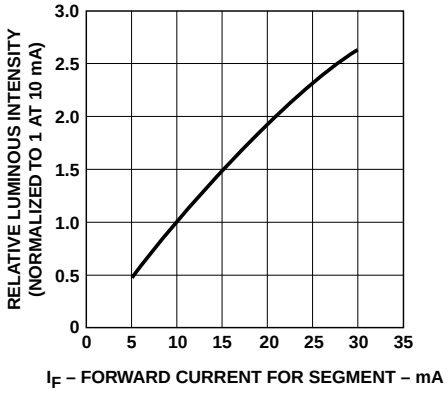


Figure 11. Relative luminous intensity vs. DC forward current.

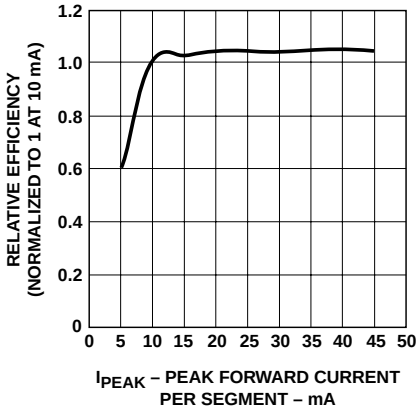


Figure 12. Relative efficiency (luminous intensity per unit current) vs. peak current.

Yellow

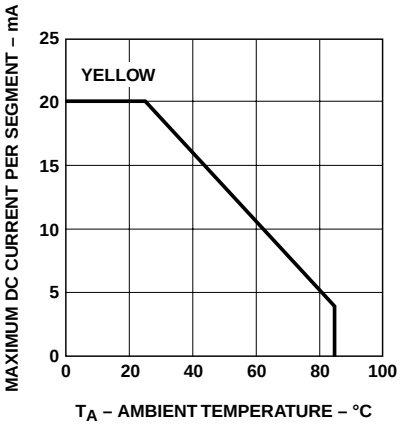


Figure 13. Maximum allowable average or DC current vs. ambient temperature.

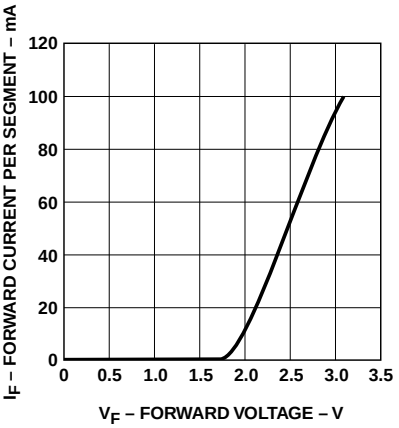


Figure 14. Forward current vs. forward voltage.

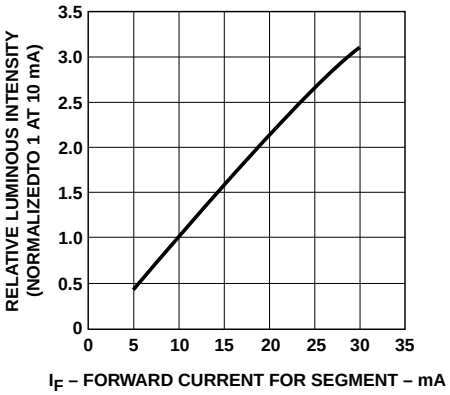


Figure 15. Relative luminous intensity vs. DC forward current.

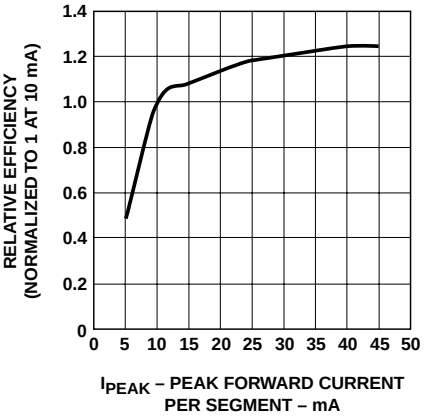


Figure 16. Relative efficiency (luminous intensity per unit current) vs. peak current.

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Data subject to change.

Obsoletes 5988-2971EN
July 17, 2004
5988-9421EN

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