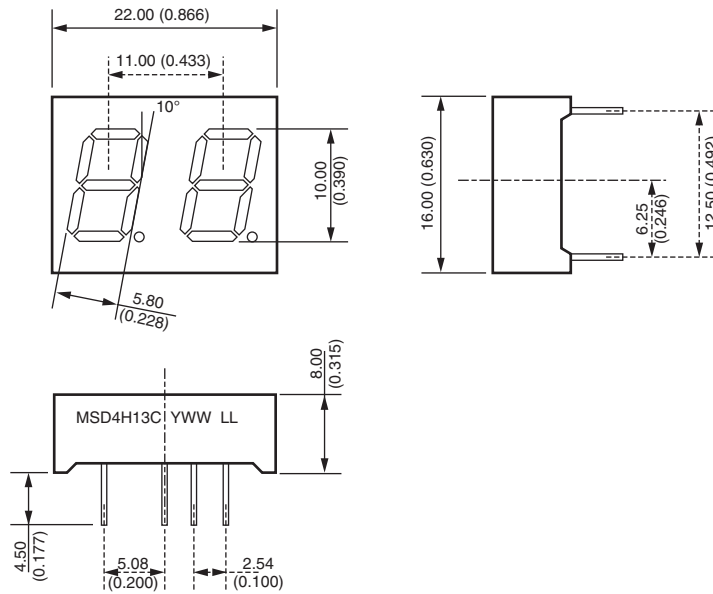


# 10.0mm (0.39 inch) Two Digit NUMERIC STICK DISPLAY

**AllnGaP Red (632nm) MSD4H13C**  
**Gap Green (Low Current) MSD4G13C**  
**GaN Blue (470nm) MSD4B13C**

## PACKAGE DIMENSIONS



**Notes:**

- Dimensions are in mm (inches)
- Tolerances are  $\pm 0.25$  (0.010) unless otherwise stated.

## Features

- Bright Bold Segments
- Common Anode/Cathode
- Low Power Consumption
- Low Current Capability
- Neutral Segments
- Grey Face
- Epoxy Encapsulated PCB
- High Performance
- High Reliability

## Applications

- Appliances
- Automotive
- Instrumentation
- Process Control

## MODELS AVAILABLE

Part Number	Color	Description	Special
MSD4H13C	AllnGaP 632nm	Two digit, Duplex, No Decimal Point, CA	Low Current
MSD4G13C	GaP 568nm	Two digit, Duplex, No Decimal Point, CA	Low Current
MSD4B13C	GaN 470nm	Two digit, Duplex, No Decimal Point, CA	Low Current

(For other color options, contact your local area Sales Manager)

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**AllnGaP Red (632nm) MSD4H13C**  
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## ABSOLUTE MAXIMUM RATINGS<sup>(1)</sup> ( $T_A = 25^\circ\text{C}$ , unless otherwise specified)

Part Number Parameter	MSD4B13C	MSD4H13C	MSD4G13C	Units
Continuous Forward Current (each segment)	25	25	25	mA
Peak Forward Current ( $F = 10\text{KHz}$ , $D/F = 1/10$ )	80	100	90	mA
Power Dissipation ( $P_D$ )	125	60	70	mW
*Derate Linearly from $25^\circ\text{C}$	0.33	0.36	0.33	mW
Reverse Voltage per Die				5 Volts
Operating and Storage Temperature Range				$-40^\circ\text{C}$ to $+85^\circ\text{C}$
Lead soldering time (1/16 inch from standoffs)				5 seconds @ $230^\circ\text{C}$

## ELECTRO-OPTICAL CHARACTERISTICS<sup>(1)</sup> ( $T_A = 25^\circ\text{C}$ , unless otherwise specified)

Part Number Parameter	MSD4B13C	MSD4H13C	MSD4G13C	Units	Test Condition
<b>Luminous intensity<sup>(2)</sup> (<math>I_V</math>)</b>					
Minimum (Standard Current)	N/A	N/A	250	ucd	$I_F = 4\text{mA}$
Typical (Standard Current)	N/A	N/A	475	ucd	$I_F = 4\text{mA}$
Minimum (Low Current)	600	510		ucd	$I_F = 2\text{mA}$
Typical (Low Current)	1200	1000		ucd	$I_F = 2\text{mA}$
<b>Forward Voltage (<math>V_F</math>)</b>					
Typical (Standard Current)		2.05	2.10	Volts	$I_F = 20\text{mA}$
Maximum (Standard Current)		2.40	2.80	Volts	$I_F = 20\text{mA}$
Typical (Low Current)	4.2	1.80		Volts	$I_F = 2\text{mA}$
Maximum (Low Current)	4.9	2.20		Volts	$I_F = 2\text{mA}$
<b>Peak Wavelength</b>	430	632	568	nm	$I_F = 10\text{mA}$
<b>Dominant Wavelength</b>	470	624	573	nm	$I_F = 10\text{mA}$
<b>Spectral Line 1/2 Width</b>	65	20	30	nm	$I_F = 10\text{mA}$
<b>Reverse B<sup>(3)</sup>. Voltage (<math>V_R</math>)</b>	10	5	5	Volts	$I_R = 100\mu\text{A}$

NOTES:

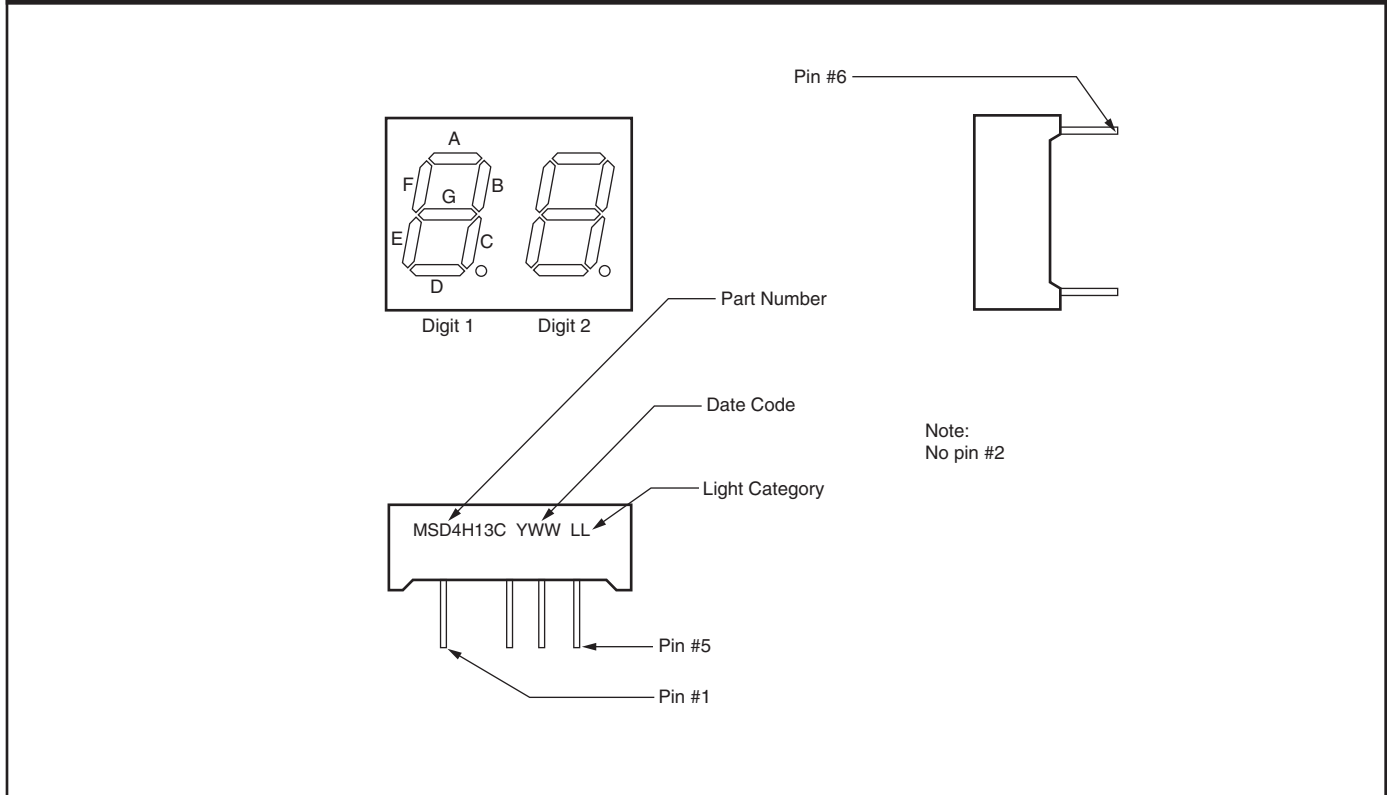
(1) Data per individual LED element

(2) Luminous intensity (ucd) = average light output per segment

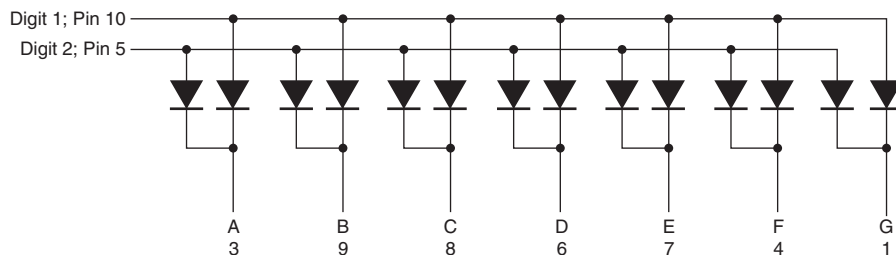
(3) B = breakdown

**AllnGaP Red (632nm) MSD4H13C**  
**Gap Green (Low Current) MSD4G13C**  
**GaN Blue (470nm) MSD4B13C**

## PIN ORIENTATION, SEGMENT IDENTIFICATION, AND PRODUCT MARKING



## SCHEMATICS

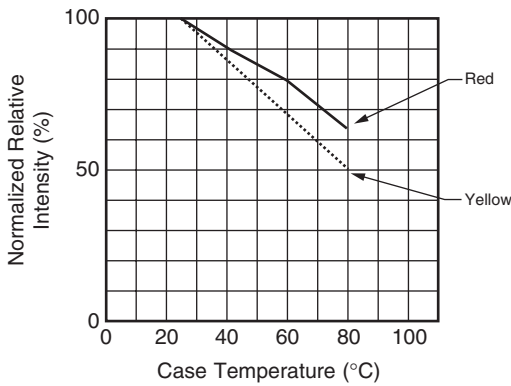


# 10.0mm (0.39 inch) Two Digit NUMERIC STICK DISPLAY

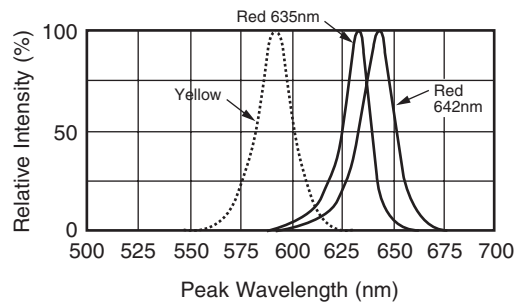
**AllnGaP Red (632nm) MSD4H13C**  
**Gap Green (Low Current) MSD4G13C**  
**GaN Blue (470nm) MSD4B13C**

**GRAPHICAL DATA AllnGaP** ( $T_A = 25^\circ\text{C}$ , unless otherwise specified)

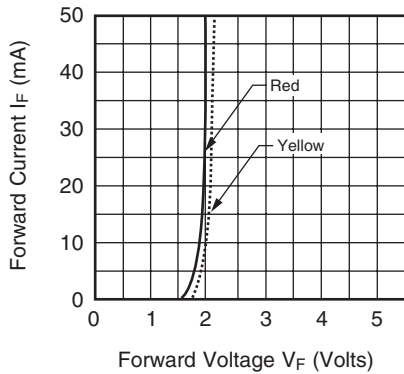
**Relative Intensity vs Case Temp.**



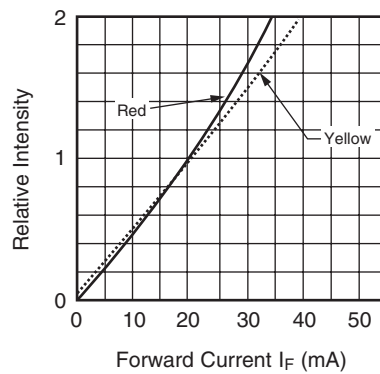
**Spectral Response**



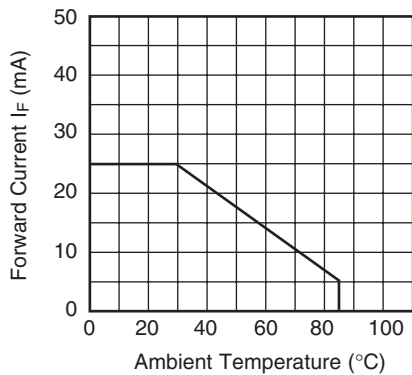
**Forward Current vs Forward Voltage**



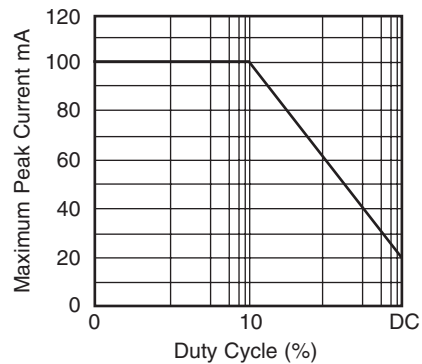
**Luminous Intensity vs Forward Current**



**Maximum Forward Current vs Ambient Temperature**

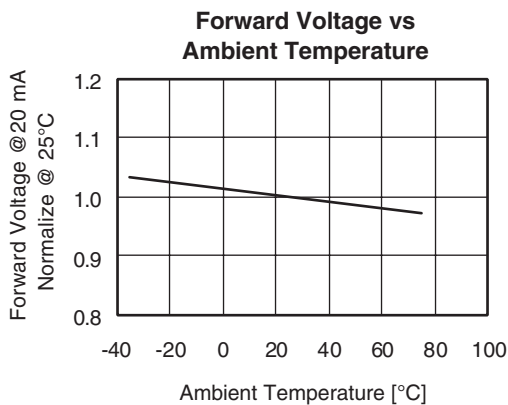
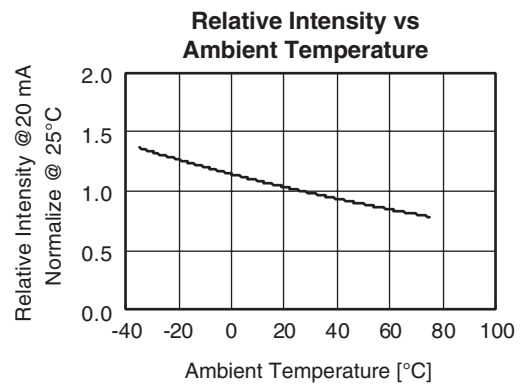
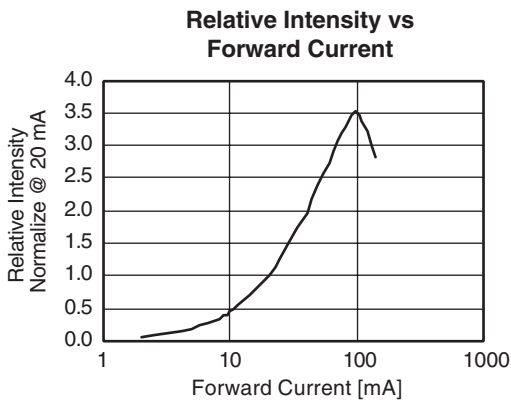
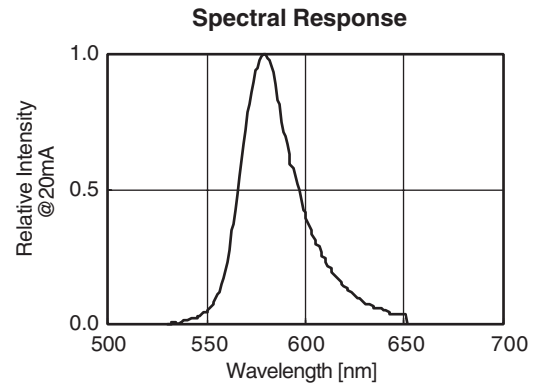
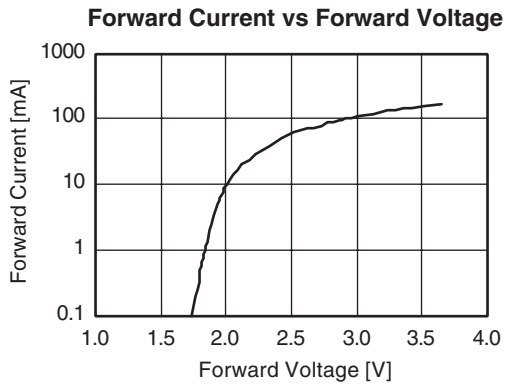


**Maximum Peak Current vs Duty Cycle**



**AllnGaP Red (632nm) MSD4H13C**  
**Gap Green (Low Current) MSD4G13C**  
**GaN Blue (470nm) MSD4B13C**

**GRAPHICAL DATA GaP Green ( $T_A = 25^\circ\text{C}$ , unless otherwise specified)**



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**AllnGaP Red (632nm) MSD4H13C**  
**Gap Green (Low Current) MSD4G13C**  
**GaN Blue (470nm) MSD4B13C**

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2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.