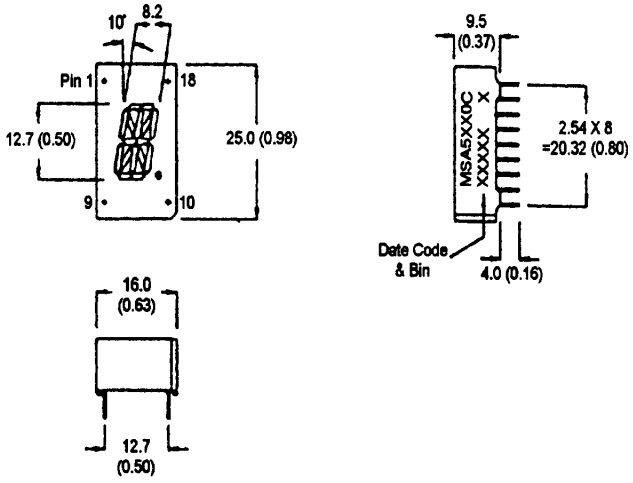
FAIRCHILD
SEMICONDUCTOR™

0.5 INCH (12.7MM) 16 SEGMENT, SINGLE DIGIT ALPHA - NUMERIC STICK DISPLAY

BRIGHT RED	MSA5160C, MSA5180C
YELLOW	MSA5360C, MSA5380C
GREEN	MSA5460C, MSA5480C
HIGH EFF. RED	MSA5960C, MSA5980C

PACKAGE DIMENSIONS



NOTES: Dimensions are in mm (inch).
All pins are 0.5 (0.02) diameter
Tolerances are ± 0.25 (0.1) unless otherwise noted.

FEATURES

Easy to read digits.
1 digit common anode or cathode.
Low power consumption.
Bold segments that are highly visible.
High brightness with high contrast
White segments on a grey face.
Directly compatible with integrated circuits.
Rugged plastic/epoxy construction.

APPLICATIONS

Digital readout displays.
Instrument panels.

MODEL NUMBERS

Part number	Color	Description
MSA5160C	Bright Red	2 Digit; Common Anode; Rt. Hand Decimal
MSA5180C	Bright Red	2 Digit; Common Cathode; Rt. Hand Decimal
MSA5360C	Yellow	2 Digit; Common Anode; Rt. Hand Decimal
MSA5380C	Yellow	2 Digit; Common Cathode; Rt Hand Decimal
MSA5460C	Green	2 Digit; Common Anode; Rt Hand Decimal
MSA5480C	Green	2 Digit; Common Cathode; Rt Hand Decimal
MSA5960C	High Eff. Red	2 Digit; Common Anode; Rt Hand Decimal
MSA5980C	High Eff. Red	2 Digit; Common Cathode; Rt Hand Decimal

(For other colour options, contact your local area Sales Office)

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ABSOLUTE MAXIMUM RATING (T_A=25°C unless otherwise specified)

Part number	B.Red MSA 5160C 5180C	Yellow MSA 5360C 5380C	Green MSA 5460C 5480C	High Eff. Red MSA 5960C 5980C	Unit
Continuous forward current (I_f) Per Segment.....	15	20	25	25	mA
Peak forward current per die (I_f). (at f = 10.0 KHz, Duty factor = 1/10)	50	90	90	90	mA
Power dissipation (P_D).....	40*	70*	70*	70*	mW
*Derate Linearly From 25°C.....	0.17	0.25	0.33	0.33	mW/°C

Reverse voltage per dice.....5V

Operating and Storage temperature range.....- 40°C to +85°C

Lead soldering time (at 1/16 inch from the bottom of lamp).....5 seconds @ 230°C

ELECTRO - OPTICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

Part number	B. Red MSA 6110C 6140C	Yellow MSA 6310C 6340C	Green MSA 6410C 6440C	High Eff. Red MSA 6910C 6940C	Test Condition
Luminous intensity (ucd)					I_F = 20 mA
minimum	320	800	800	800	
typical	750	2200	2000	2000	
Forward voltage (V_F)					I_F = 20 mA
typical	2.1	2.1	2.1	2.0	
maximum	2.6	2.8	2.8	2.8	
Peak wavelength (nm)	697	590	570	635	I_F = 20 mA
Spectral line half width (nm)	90	35	30	45	I_F = 20 mA
Reverse breakdown voltage (V_R)	5	5	5	5	I_R = 100 uA

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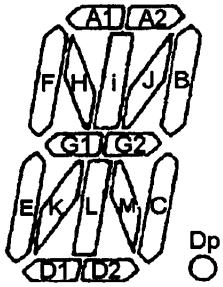
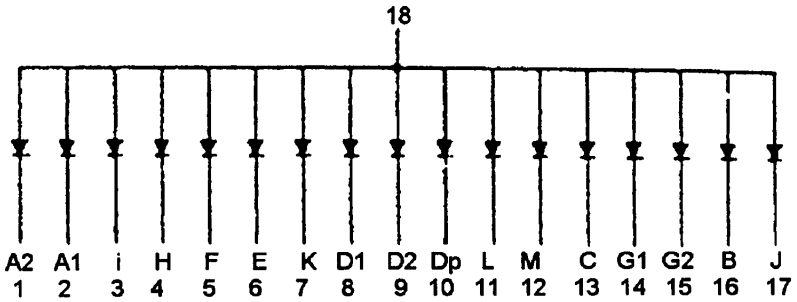
ALPHA - NUMERIC STICK DISPLAY

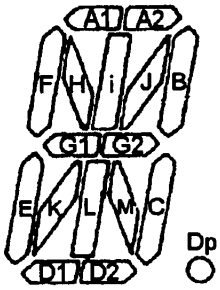
PINOUT

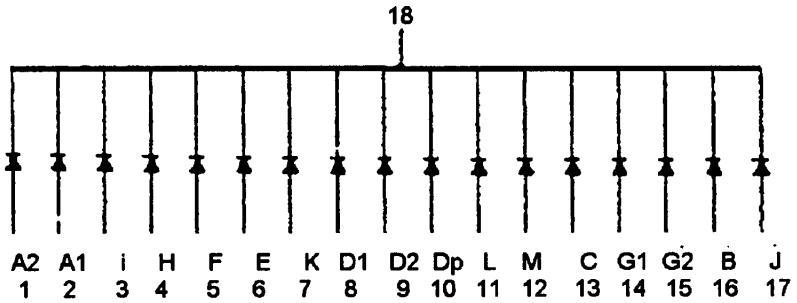
MSA6X10C - Common Anode





MSA6X40C - Common Cathode





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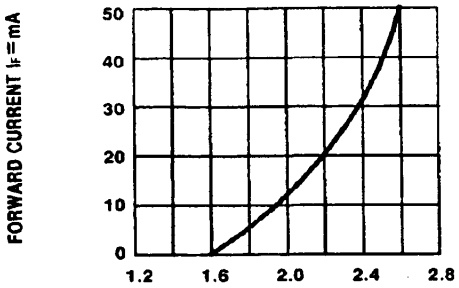
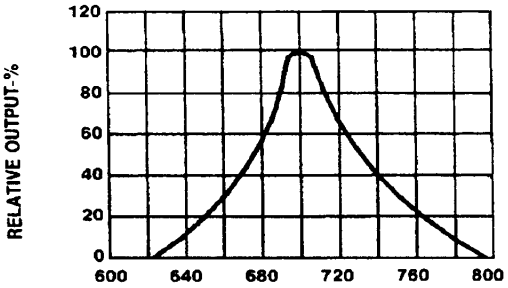
0.5 INCH (12.7MM) 16 SEGMENT, SINGLE DIGIT ALPHA - NUMERIC STICK DISPLAY

GRAPHICAL DETAIL: Bright Red (T_A = 25°C unless otherwise specified)



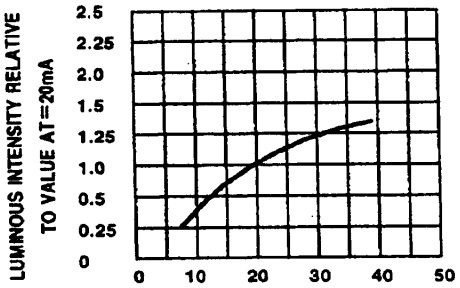
FORWARD VOLTAGE (VF)-VOLTS

Fig.1 FORWARD CURRENT VS. FORWARD VOLTAGE.



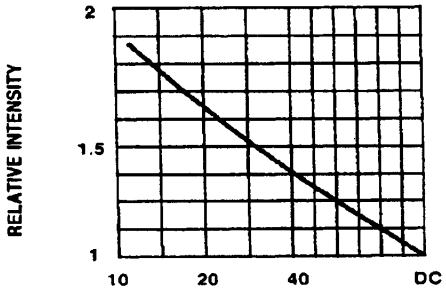
WAVELENGTH (λ)-nm

Fig.2 SPECTRAL RESPONSE



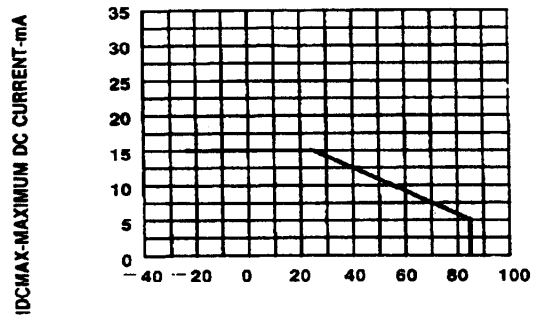
IF-FORWARD CURRENT-mA

Fig.3 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT



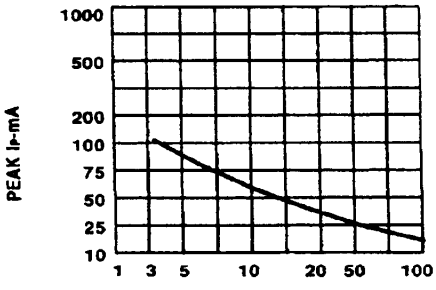
DUTY CYCLE % PER SEGMENT (AVERAGE IF=10mA)

Fig.5 LUMINOUS INTENSITY VS. DUTY CYCLE



TA AMBIENT TEMPERATURE °C

Fig.4 MAXIMUM ALLOWABLE DC CURRENT PER SEGMENT VS. A FUNCTION OF AMBIENT TEMPERATURE.



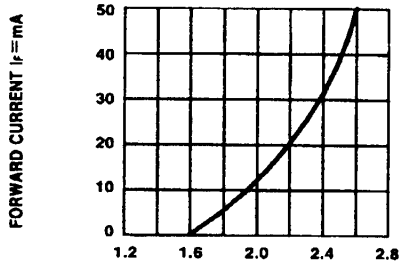
DUTY CYCLE %

Fig. 6 MAX PEAK CURRENT VS. DUTY CYCLE % (REFRESH RATE f=1 KHz)

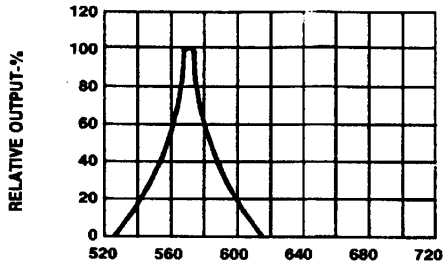
FAIRCHILD
SEMICONDUCTOR™

0.5 INCH (12.7MM) 16 SEGMENT, SINGLE DIGIT ALPHA - NUMERIC STICK DISPLAY

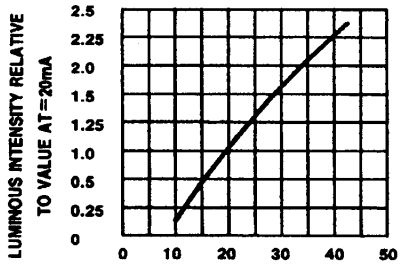
GRAPHICAL DETAIL: Green (T_A = 25°C unless otherwise specified)



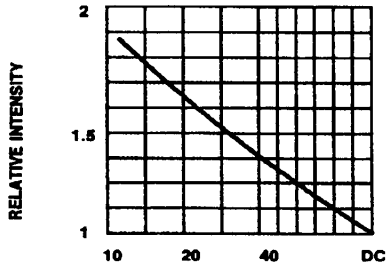
FORWARD VOLTAGE (V_F)-VOLTS
Fig.1 FORWARD CURRENT VS. FORWARD VOLTAGE.



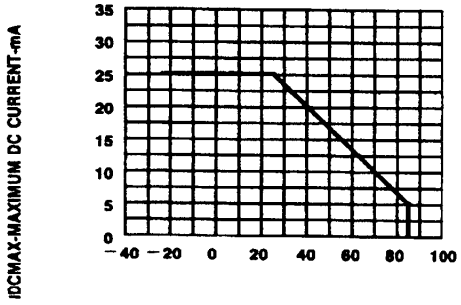
WAVELENGTH (λ)-nm
Fig.2 SPECTRAL RESPONSE



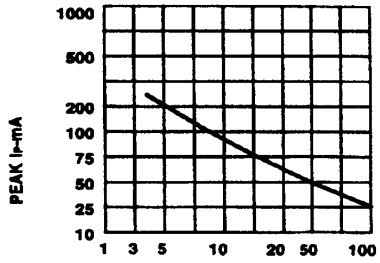
I_F-FORWARD CURRENT-mA
Fig.3 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT



DUTY CYCLE % PER SEGMENT
(AVERAGE I_F=10mA)
Fig.5 LUMINOUS INTENSITY VS. DUTY CYCLE



T_A AMBIENT TEMPERATURE °C
Fig.4 MAXIMUM ALLOWABLE DC CURRENT PER SEGMENT CS. A FUNCTION OF AMBIENT TEMPERATURE.



DUTY CYCLE %
Fig. 6 MAX PEAK CURRENT VS. DUTY CYCLE % (REFRESH RATE f=1 KHz)

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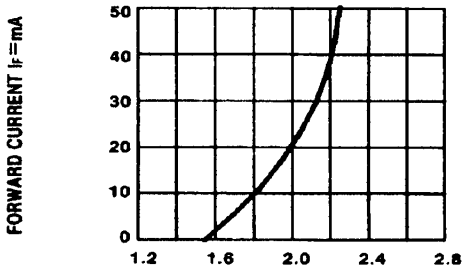
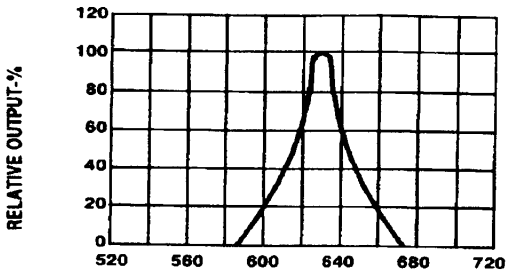
0.5 INCH (12.7MM) 16 SEGMENT, SINGLE DIGIT ALPHA - NUMERIC STICK DISPLAY

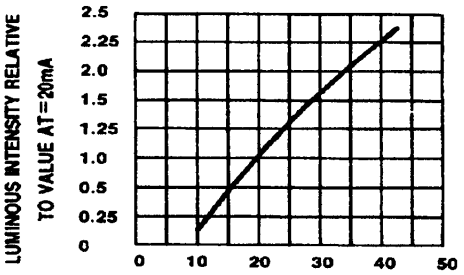
GRAPHICAL DETAIL: High Efficiency Red (T_A = 25°C unless otherwise specified)



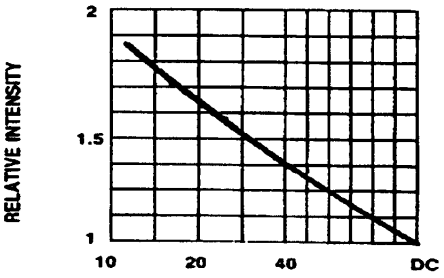
FORWARD VOLTAGE (V_F)-VOLTS
Fig.1 FORWARD CURRENT VS. FORWARD VOLTAGE.



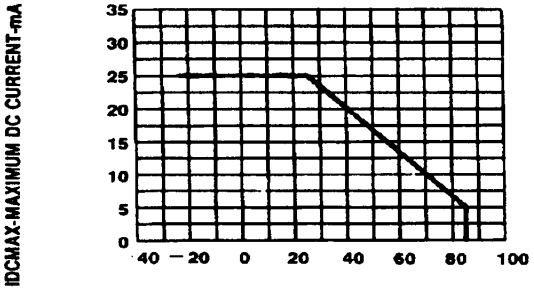
WAVELENGTH (λ)-nm
Fig.2 SPECTRAL RESPONSE



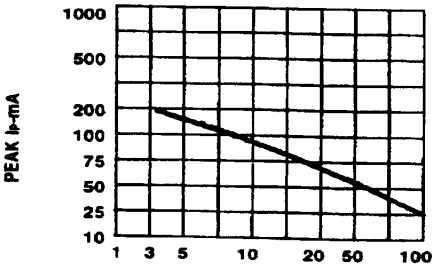
IF-FORWARD CURRENT-mA
Fig.3 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT



DUTY CYCLE % PER SEGMENT
(AVERAGE IF=10mA)
Fig.5 LUMINOUS INTENSITY VS. DUTY CYCLE



TA AMBIENT TEMPERATURE °C
Fig.4 MAXIMUM ALLOWABLE DC CURRENT PER SEGMENT VS. A FUNCTION OF AMBIENT TEMPERATURE.



DUTY CYCLE %
Fig. 6 MAX PEAK CURRENT VS. DUTY CYCLE %
(REFRESH RATE f=1 KHz)

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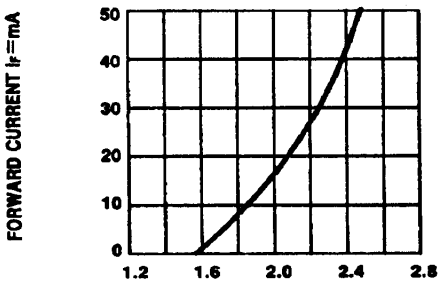
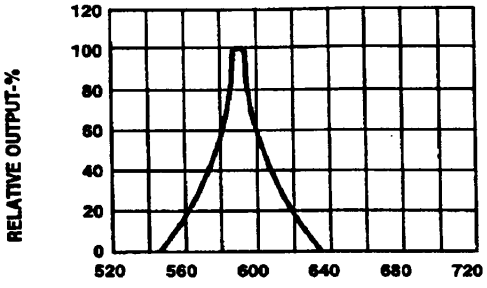
0.5 INCH (12.7MM) 16 SEGMENT, SINGLE DIGIT ALPHA - NUMERIC STICK DISPLAY

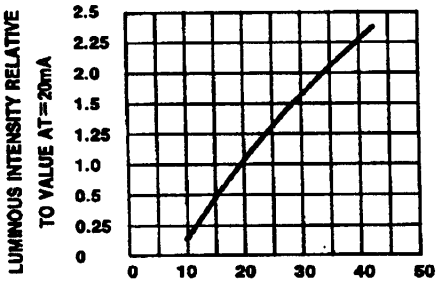
GRAPHICAL DETAIL: Yellow (T_A = 25°C unless otherwise specified)



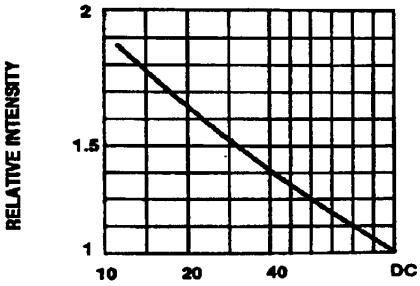
FORWARD VOLTAGE (V_F)-VOLTS
Fig.1 FORWARD CURRENT VS. FORWARD VOLTAGE.



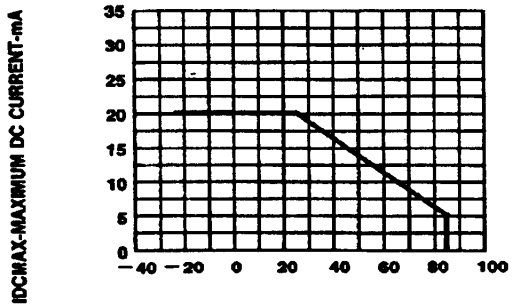
WAVELENGTH (λ)-nm
Fig.2 SPECTRAL RESPONSE



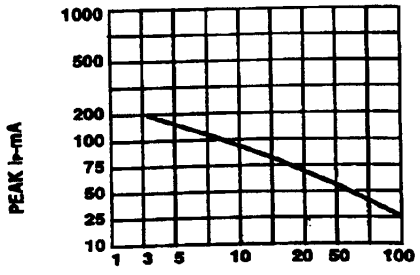
I_F-FORWARD CURRENT-mA
Fig.3 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT



DUTY CYCLE % PER SEGMENT
(AVERAGE I_F=10mA)
Fig.5 LUMINOUS INTENSITY VS.DUTY CYCLE



T_A MBIENT TEMPERATURE °C
Fig.4 MAXIMUM ALLOWABLE DC CURRENT PER SEGMENT VS. A FUNCTION OF AMBIENT TEMPERATURE.



DUTY CYCLE %
Fig. 6 MAX PEAK CURRENT VS. DUTY CYCLE %
(REFRESH RATE f=1 KHz)

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0.5 INCH (12.7MM) 16 SEGMENT, SINGLE DIGIT ALPHA - NUMERIC STICK DISPLAY

DISCLAIMER

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

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FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
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.