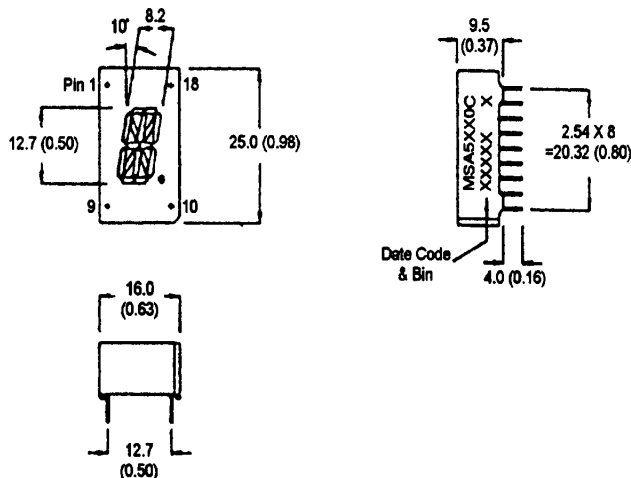


**BRIGHT RED MSA5160C, MSA5180C
YELLOW MSA5360C, MSA5380C
GREEN MSA5460C, MSA5480C
HIGH EFF. RED MSA5960C, MSA5980C**

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

<u>Part number</u>	<u>Color</u>	<u>Description</u>
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)

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

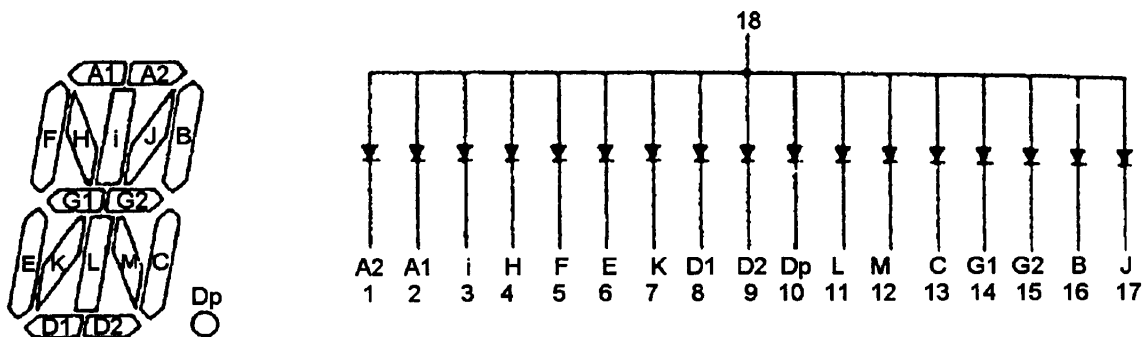
Part number	B.Red MSA 5160C 5180C	Yellow MSA 5360C 5380C	Green MSA 5460C 5480C	High Eff. Red MSA 5960C 5980C	Unit
Continuous forward current (I _f) Per Segment.....	15	20	25	25	mA
Peak forward current per die (I _f). (at f = 10.0 KHz, Duty factor = 1/10)	50	90	90	90	mA
Power dissipation (P _D).....	40*	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)

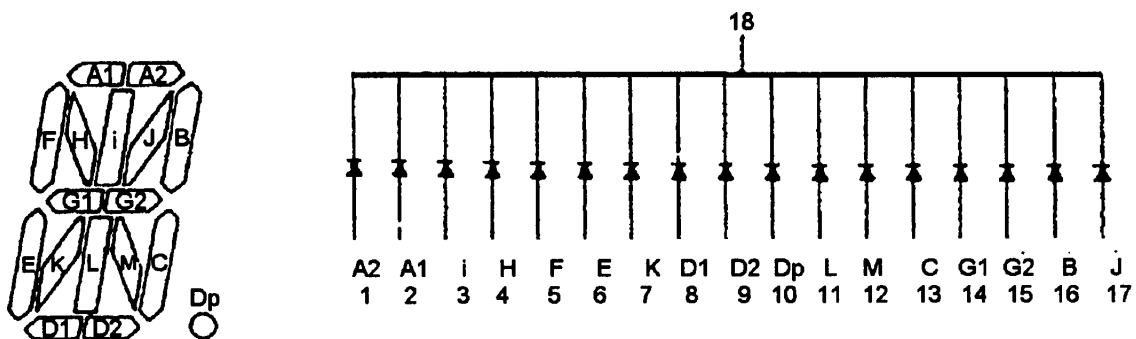
Part number	B. Red MSA 6110C 6140C	Yellow MSA 6310C 6340C	Green MSA 6410C 6440C	High Eff. Red MSA 6910C 6940C	Test Condition
Luminous intensity (ucd) minimum	320	800	800	800	I _f = 20 mA
typical	750	2200	2000	2000	
Forward voltage (V _f) typical	2.1	2.1	2.1	2.0	I _f = 20 mA
maximum	2.6	2.8	2.8	2.8	
Peak 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

PINOUT

MSA6X10C - Common Anode



MSA6X40C - Common Cathode



GRAPHICAL DETAIL: Bright Red ($T_A = 25^\circ\text{C}$ unless otherwise specified)

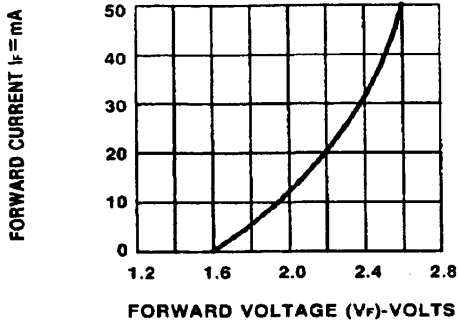


Fig.1 FORWARD CURRENT VS. FORWARD VOLTAGE.

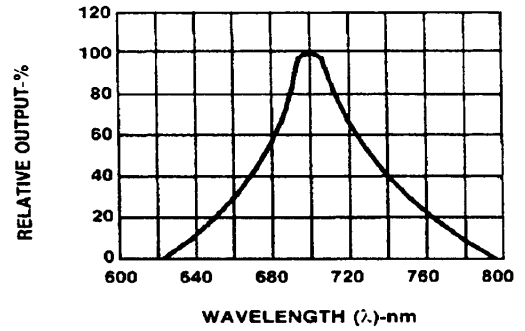


Fig.2 SPECTRAL RESPONSE

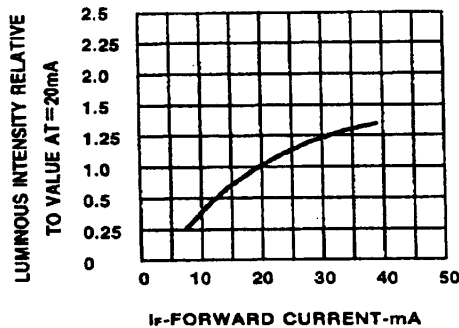


Fig.3 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

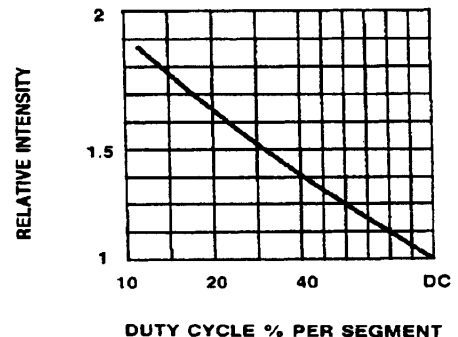


Fig.5 LUMINOUS INTENSITY VS. DUTY CYCLE

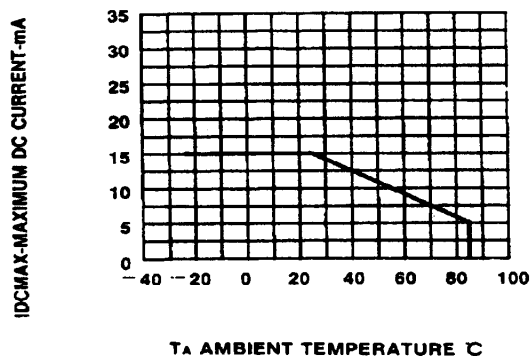


Fig.4 MAXIMUM ALLOWABLE DC CURRENT PER SEGMENT VS. A FUNCTION OF AMBIENT TEMPERATURE.

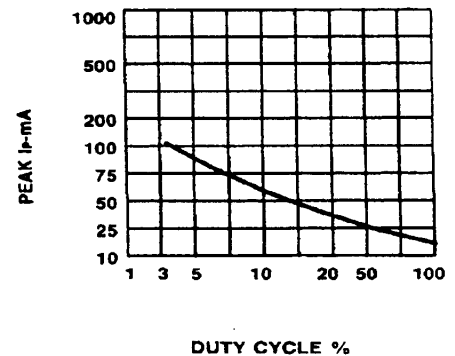


Fig. 6 MAX PEAK CURRENT VS. DUTY CYCLE % (REFRESH RATE $f=1\text{ KHz}$)

GRAPHICAL DETAIL: Green ($T_A = 25^\circ\text{C}$ unless otherwise specified)

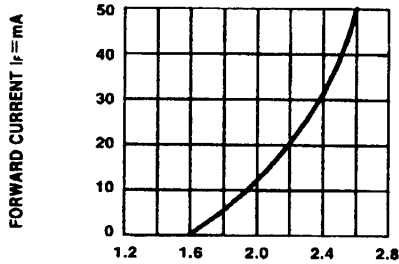


Fig.1 FORWARD CURRENT VS. FORWARD VOLTAGE.

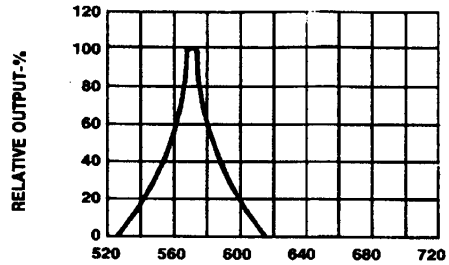


Fig.2 SPECTRAL RESPONSE

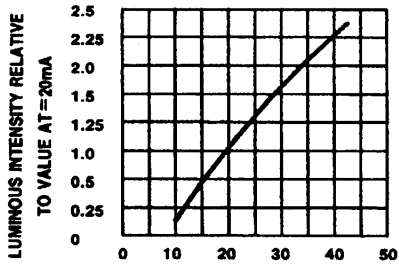


Fig.3 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

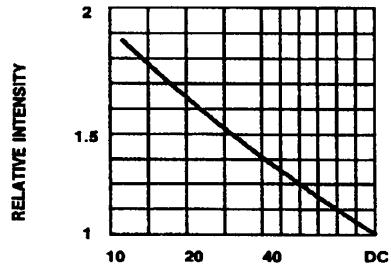


Fig.5 LUMINOUS INTENSITY VS. DUTY CYCLE

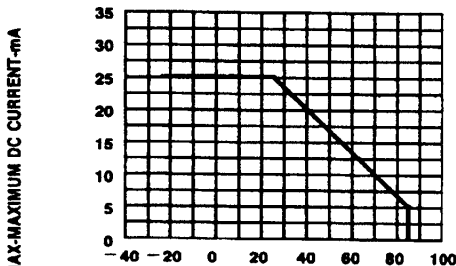


Fig.4 MAXIMUM ALLOWABLE DC CURRENT PER SEGMENT CS. A FUNCTION OF AMBIENT TEMPERATURE.

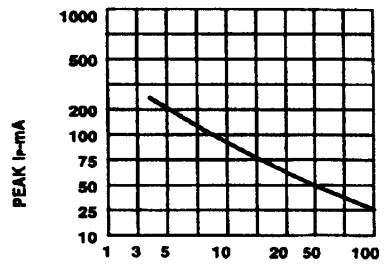


Fig. 6 MAX PEAK CURRENT VS. DUTY CYCLE % (REFRESH RATE $f=1\text{ KHz}$)

GRAPHICAL DETAIL: High Efficiency Red ($T_A = 25^\circ\text{C}$ unless otherwise specified)

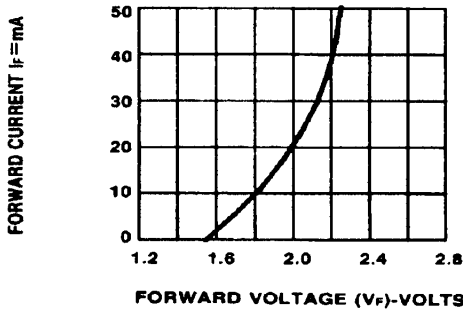


Fig.1 FORWARD CURRENT VS. FORWARD VOLTAGE.

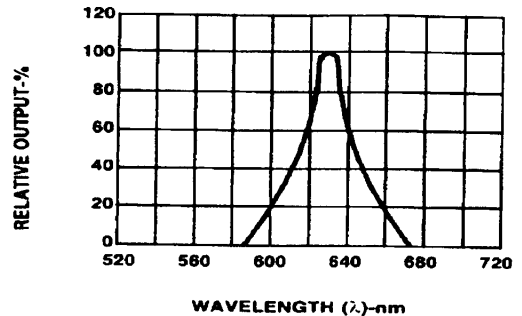


Fig.2 SPECTRAL RESPONSE

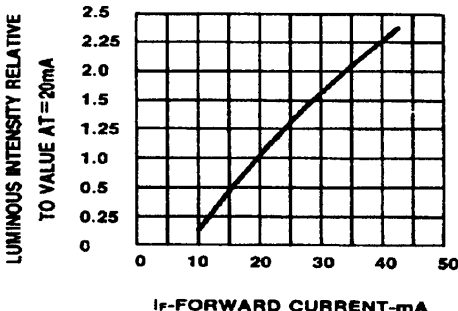


Fig.3 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

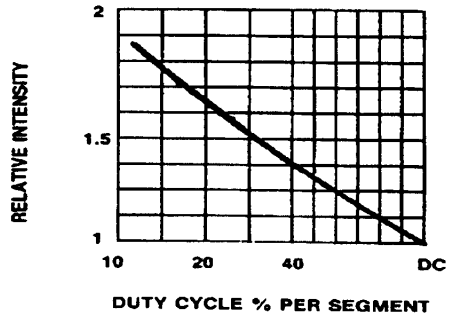


Fig.5 LUMINOUS INTENSITY VS. DUTY CYCLE

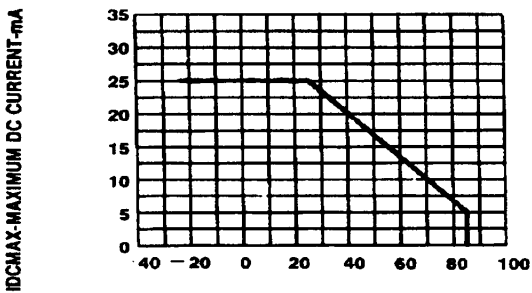


Fig.4 MAXIMUM ALLOWABLE DC CURRENT PER SEGMENT VS. A FUNCTION OF AMBIENT TEMPERATURE.

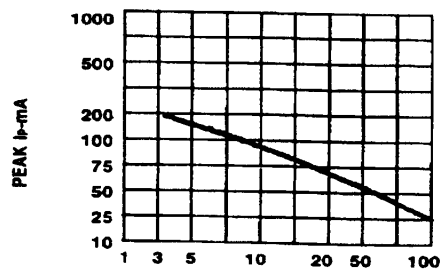


Fig. 6 MAX PEAK CURRENT VS. DUTY CYCLE % (REFRESH RATE $f = 1\text{ KHz}$)

GRAPHICAL DETAIL: Yellow ($T_A = 25^\circ\text{C}$ unless otherwise specified)

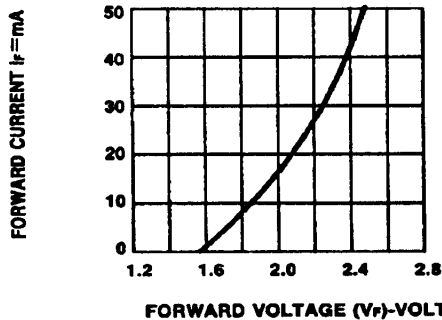


Fig.1 FORWARD CURRENT VS. FORWARD VOLTAGE.

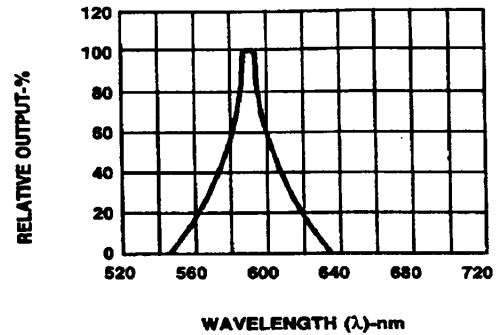


Fig.2 SPECTRAL RESPONSE

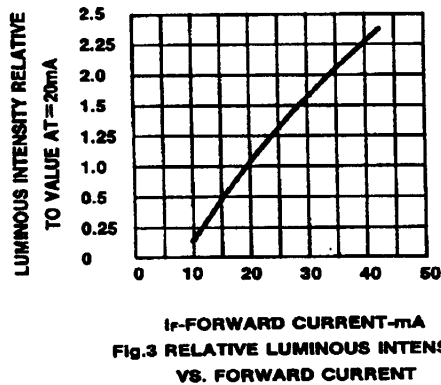


Fig.3 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

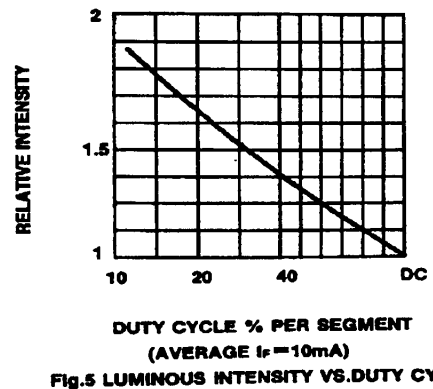


Fig.5 LUMINOUS INTENSITY VS. DUTY CYCLE

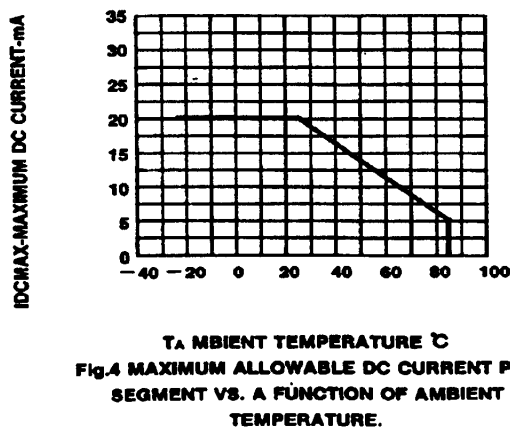


Fig.4 MAXIMUM ALLOWABLE DC CURRENT PER SEGMENT VS. A FUNCTION OF AMBIENT TEMPERATURE.

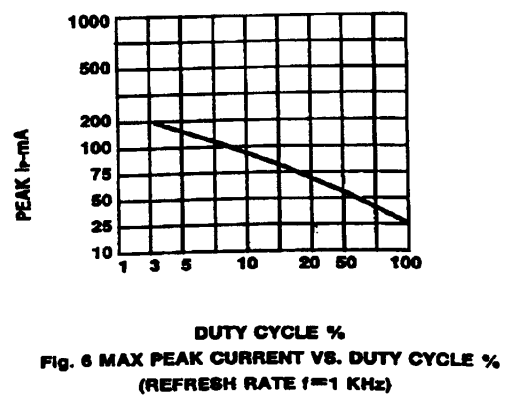


Fig. 6 MAX PEAK CURRENT VS. DUTY CYCLE % (REFRESH RATE $f = 1\text{ KHz}$)

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