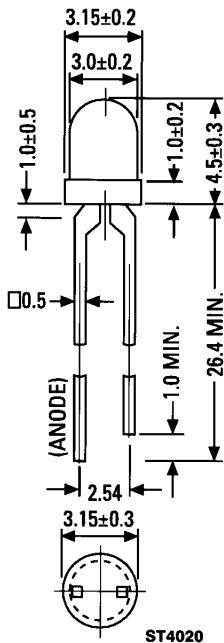




**INTEGRATED T-1 RESISTOR LAMPS  
5 VOLT and 12 VOLT SERIES**

**RED MR5060 TINTED/MR5660 UNTINTED  
HIGH EFFICIENCY RED MR5760/MR5761 TINTED  
YELLOW MR5360/MR5361 TINTED  
HIGH EFFICIENCY GREEN MR5460/MR5461 TINTED**

**PACKAGE DIMENSIONS**



ST4020

- NOTES:  
 1. ALL DIMENSIONS ARE IN MM.  
 2. LEAD SPACING IS MEASURED WHERE THE LEADS EMERGE FROM THE PACKAGE.  
 3. PROTRUDED RESIN UNDER THE FLANGE IS 1.5 mm (0.059") MAX.

**DESCRIPTION**

This group of T-1 size LED lamps contain integral resistors. Operation at 5 volts (MR5X60 Part Nos.) or 12 volts (MR5X61 Part Nos.) is possible without the use of external current limiting resistors. Color tinted, diffused epoxy packages are used for all the lamps in this group; with the exception of the MR5660, which is no tint - but diffused.

**FEATURES**

- Integral Current Limiting Resistor (No external resistor required)
- TTL Compatible
- Operate with 5 Volt & 12 Volt Supplies
- All Colors - Red, HER, Yellow, Green
- Wide Viewing Angle
- Solid-State Reliability

**PHYSICAL CHARACTERISTICS**

TYPE	SOURCE COLOR	LENS COLOR
MR5060	Red	Red Diffused
MR5660	Red	Clear Diffused
MR5760	High Efficiency Red	Red Diffused
MR5761	High Efficiency Red	Red Diffused
MR5360	Yellow	Yellow Diffused
MR5361	Yellow	Yellow Diffused
MR5460	High Efficiency Green	Green Diffused
MR5461	High Efficiency Green	Green Diffused



## INTEGRATED T-1 RESISTOR LAMPS 5 VOLT and 12 VOLT SERIES

<b>ELECTRO-OPTICAL CHARACTERISTICS</b> (TA = 25°C Unless Otherwise Specified)														
		RED				HIGH EFFICIENCY RED				UNITS		TEST CONDITION		
PARAMETER	SYMBOL	MR5060		MR5660		MR5760		MR5761						
		MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
Luminous Intensity	I <sub>v</sub>										1.5	4.0	mcd	V <sub>F</sub> =12 V
Luminous Intensity	I <sub>v</sub>	0.8	1.5		0.8	1.5		1.5	4.0				mcd	V <sub>F</sub> =5 V
Total Viewing Angle	2θ <sub>1/2</sub>	60		60		60		60					Deg	
Peak Wavelength	λ <sub>p</sub>	655		655		635		635					nm	
Spectral Line Halfwidth	Δλ <sub>1/2</sub>	24		24		40		40					nm	
Forward Current 12V Devices	I <sub>F</sub>									13	20		mA	V <sub>F</sub> =12 V
Forward Current 5V Devices	I <sub>F</sub>	13	20		13	20		10	15				mA	V <sub>F</sub> =5 V
Reverse Breakdown Voltage	V <sub>R</sub>	5.0		5.0		5.0		5.0						I <sub>R</sub> =100μA

<b>ELECTRO-OPTICAL CHARACTERISTICS</b> (TA = 25°C Unless Otherwise Specified)															
		YELLOW				HIGH EFFICIENCY GREEN				UNITS		TEST CONDITION			
PARAMETER	SYMBOL	MR5360		MR5361		MR5460		MR5461							
		MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.		
Luminous Intensity	I <sub>v</sub>			1.5		4.0				1.5		4.0		mcd	V <sub>F</sub> =12 V
Luminous Intensity	I <sub>v</sub>	1.5	4.0					1.5	4.0				mcd	V <sub>F</sub> =5 V	
Total Viewing Angle	2θ <sub>1/2</sub>	60		60		60		60					Deg		
Peak Wavelength	λ <sub>p</sub>	583		583		565		565					nm		
Spectral Line Halfwidth	Δλ <sub>1/2</sub>	36		36		28		28					nm		
Forward Current 12V Devices	I <sub>F</sub>			13		20				13		20		mA	V <sub>F</sub> =12 V
Forward Current 5V Devices	I <sub>F</sub>	10	15					12	15				mA	V <sub>F</sub> =5 V	
Reverse Breakdown Voltage	V <sub>R</sub>	5.0		5.0		5.0		5.0						I <sub>R</sub> =100μA	

<b>ABSOLUTE MAXIMUM RATINGS</b> (TA = 25°C Unless Otherwise Specified)				
	RED/HER/YELLOW 5 VOLT LAMPS	RED/HER/YELLOW 12 VOLT LAMPS	GREEN 5 VOLT LAMPS	GREEN 12 VOLT LAMPS
DC Forward Voltage (T <sub>A</sub> =25°C)	7.5 Volts	15 Volts	7.5 Volts	15 Volts
Reverse Voltage (I <sub>R</sub> =100 μA)	5 Volts	5 Volts	5 Volts	5 Volts
Operating Temperature Range	-40°C to +85°C	-40°C to +85°C	-20°C to +85°C	-20°C to +85°C
Storage Temperature Range	-55°C to +100°C	-55°C to +100°C	-55°C to +100°C	-55°C to +100°C
Lead Soldering Temperature	260°C for 5 seconds			

**TYPICAL ELECTRO-OPTICAL CHARACTERISTIC CURVES**

(TA = 25°C Unless Otherwise Specified)

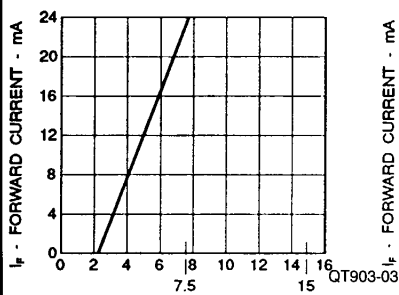


Fig. 1. Forward Current vs. Applied Forward Voltage 5 Volt Devices

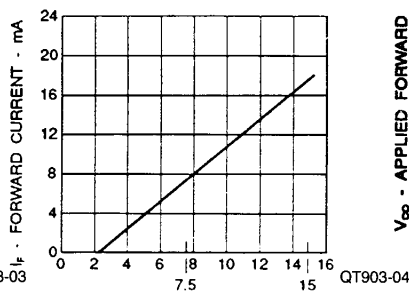


Fig. 2. Forward Current vs. Applied Forward Voltage 12 Volt Devices

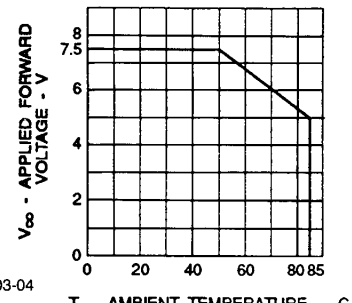


Fig. 3. Maximum Allowed Applied Forward Voltage vs. Ambient Temperature  
RθJA = 175°C/W 5 Volt Devices

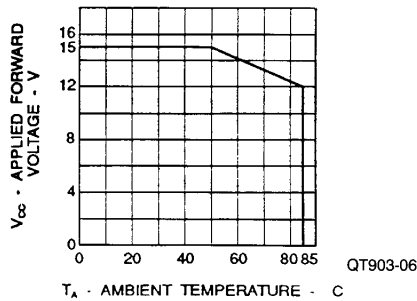


Fig. 4. Maximum Allowed Applied Forward Voltage vs. Ambient Temperature  
RθJA = 175°C/W 12 Volt Devices

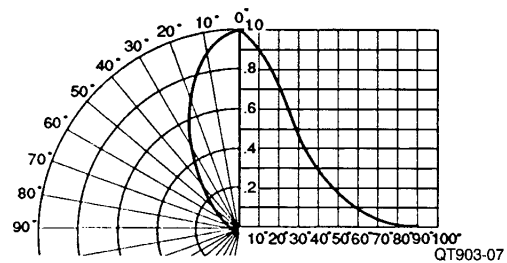


Fig. 5. Relative Luminous Intensity vs. Angular Displacement for T-1 Package

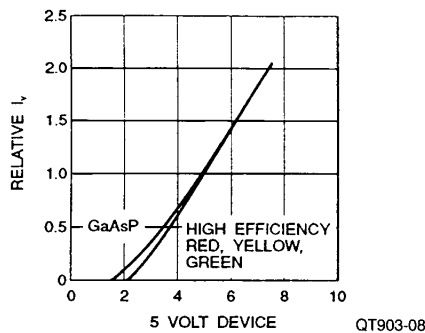


Fig. 6. Relative Luminous Intensity vs. Applied Forward Voltage 5 Volt Devices

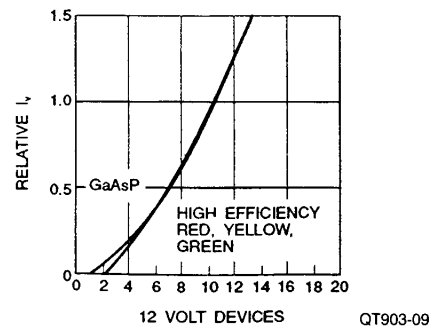


Fig. 7. Relative Luminous Intensity vs. Applied Forward Voltage 12 Volt Devices