T-1 3/4 (5mm) Ultra Bright AS AlInGaP LED Lamps

LTL2F3QRK/QEK/QHK/QAK/QFK/QYK/QSK 8degree
LTL2H3QRK/QEK/QHK/QAK/QFK/QYK/QSK 15degree
LTL2P3QRK/QEK/QHK/QAK/QFK/QYK/QSK 22degree
LTL2R3QRK/QEK/QHK/QAK/QFK/QYK/QSK 30degree

Features

- High luminous intensity output.
- Low power consumption.
- High efficiency.
- Versatile mounting on P.C. board or panel.
- I.C. Compatible/low current requirements.
- Popular T-13/4 diameter.

Description

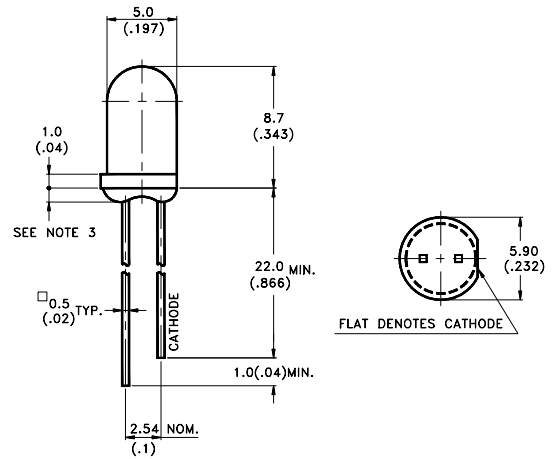
The source color devices are made with Aluminum Indium Gallium Phosphide on Gallium Arsenide light emitting diode.
The devices are made with water clear epoxy package.
And with 8,15,22 and 30 degrees of viewing angle.

Application

Available for outdoor application.

- Message sign.
- Traffic sign.
- Automotive.

Package Dimensions



Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is ± 0.25mm (.010") unless otherwise noted.
3. Protruded resin under flange is 1.0mm (.04") max.
4. Lead spacing is measured where the leads emerge from the package.
5. Specifications are subject to change without notice.

Devices

Part No. LTL	Lens	Source Color
2F3QRK / 2H3QRK 2P3QRK / 2R3QRK	Water Clear	AlInGaP Super Red
2F3QEK / 2H3QEK 2P3QEK / 2R3QEK	Water Clear	AlInGaP Red
2F3QHK / 2H3QHK 2P3QHK / 2R3QHK	Water Clear	AlInGaP Red Orange
2F3QAK / 2H3QAK 2P3QAK / 2R3QAK	Water Clear	AlInGaP Red Orange
2F3QFK / 2H3QFK 2P3QFK / 2R3QFK	Water Clear	AlInGaP Yellow Orange
2F3QYK / 2H3QYK 2P3QYK / 2R3QYK	Water Clear	AlInGaP Amber Yellow
2F3QSK / 2H3QSK 2P3QSK / 2R3QSK	Water Clear	AlInGaP Yellow

Absolute Maximum Ratings at Ta=25℃

Parameter	Super Red	Red	Red Orange	Red Orange	Yellow Orange	Amber Yellow	Yellow	Unit
Power Dissipation	120	120	120	120	120	120	120	mW
Peak Forward Current (1/10 Duty Cycle, 0.1ms Pulse Width)	160	160	160	160	160	160	160	mA
Continuous Forward Current	50	50	50	50	50	50	50	mA
Derating Linear From 50℃	0.6	0.6	0.6	0.6	0.6	0.6	0.6	mA/℃
Reverse Voltage	5	5	5	5	5	5	5	v
Operating Temperature Range	-40℃ to + 100℃							
Storage Temperature Range	-55℃ to + 100℃							
Lead Soldering Temperature [1.6mm(.063") From Body]	260℃ for 5 Seconds							

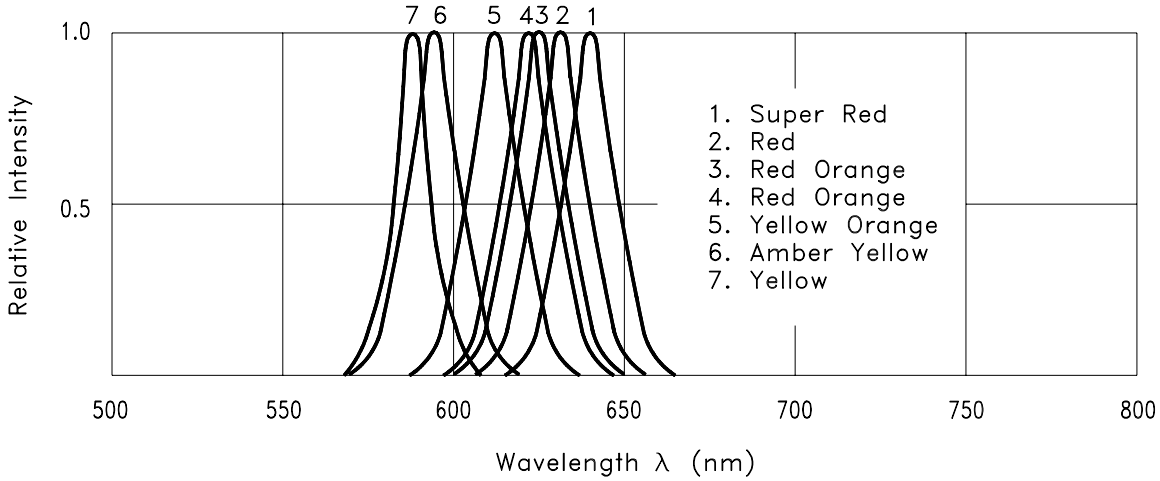


Fig.1 Relative Intensity vs. Wavelength

Electrical / Optical Characteristics and Curves at Ta= 25℃

Parameter	Symbol	Part No. LTL	Min.	Typ.	Max.	Unit	Test Condition
Luminous Intensity	Iv	2F3QRK	1000	2600		mcd	IF=20mA Note 1 Note 2
		2F3QEK	1000	3600			
		2F3QHK	1000	3600			
		2F3QAK	1000	3600			
		2F3QFK	1000	3600			
		2F3QYK	1000	3600			
		2F3QSK	1000	3600			
Peak Emission Wavelength	λP	2F3QRK		639		nm	Measurement @ peak (Fig.1)
		2F3QEK		632			
		2F3QHK		624			
		2F3QAK		621			
		2F3QFK		611			
		2F3QYK		595			
		2F3QSK		588			
Dominant Wavelength	λd	2F3QRK		631		nm	Note 5
		2F3QEK		624			
		2F3QHK		618			
		2F3QAK		615			
		2F3QFK		605			
		2F3QYK		592			
		2F3QSK		587			
Spectral Line Half-Width	△λ	2F3QRK		20		nm	
		2F3QEK		20			
		2F3QHK		18			
		2F3QAK		18			
		2F3QFK		17			
		2F3QYK		15			
		2F3QSK		15			
Forward Voltage	VF	2F3QRK		1.9	2.3	V	IF=20mA
		2F3QEK		2.0	2.4		
		2F3QHK		2.0	2.4		
		2F3QAK		2.0	2.4		
		2F3QFK		2.0	2.4		
		2F3QYK		2.0	2.4		
		2F3QSK		2.0	2.4		
Viewing Angle	$2\theta_{1/2}$			8		deg	Note 2 (Fig.5)
Reverse Current	IR				100	μA	VR=5V
Capacitance	C			40		pF	VF=0 f=1MHz

Notes:
1. Luminous intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve.
2. Luminous intensity rank classified products support two ranks.
3. $\theta_{1/2}$ is the off-axis angle at which the luminous intensity is half the axial luminous intensity.
4. Iv classification code is marked on each packing bag.
5. The dominant wavelength, λd is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.

Electrical / Optical Characteristics and Curves at Ta= 25℃

Parameter	Symbol	Part No. LTL	Min.	Typ.	Max.	Unit	Test Condition
Luminous Intensity	Iv	2H3QRK	560	1300		mcd	IF=20mA Note 1 Note 2
		2H3QEK	560	1700			
		2H3QHK	560	1700			
		2H3QAK	560	1700			
		2H3QFK	560	1700			
		2H3QYK	560	1700			
		2H3QSK	560	1700			
Peak Emission Wavelength	λP	2H3QRK		639		nm	Measurement @ peak (Fig.1)
		2H3QEK		632			
		2H3QHK		624			
		2H3QAK		621			
		2H3QFK		611			
		2H3QYK		595			
		2H3QSK		588			
Dominant Wavelength	λd	2H3QRK		631		nm	Note 5
		2H3QEK		624			
		2H3QHK		618			
		2H3QAK		615			
		2H3QFK		605			
		2H3QYK		592			
		2H3QSK		587			
Spectral Line Half-Width	△λ	2H3QRK		20		nm	
		2H3QEK		20			
		2H3QHK		18			
		2H3QAK		18			
		2H3QFK		17			
		2H3QYK		15			
		2H3QSK		15			
Forward Voltage	VF	2H3QRK		1.9	2.3	V	IF=20mA
		2H3QEK		2.0	2.4		
		2H3QHK		2.0	2.4		
		2H3QAK		2.0	2.4		
		2H3QFK		2.0	2.4		
		2H3QYK		2.0	2.4		
		2H3QSK		2.0	2.4		
Viewing Angle	2θ1/2			15		deg	Note 2 (Fig.5)
Reverse Current	IR				100	μA	VR=5V
Capacitance	C			40		pF	VF=0 f=1MHz

Notes:
1. Luminous intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve.
2. Luminous intensity rank classified products support two ranks.
3. $\theta 1/2$ is the off-axis angle at which the luminous intensity is half the axial luminous intensity.
4. Iv classification code is marked on each packing bag.
5. The dominant wavelength, λd is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.

Electrical / Optical Characteristics and Curves at Ta= 25℃

Parameter	Symbol	Part No. LTL	Min.	Typ.	Max.	Unit	Test Condition
Luminous Intensity	Iv	2P3QRK	320	800		mcd	IF=20mA Note 1 Note 2
		2P3QEK	320	1000			
		2P3QHK	320	1000			
		2P3QAK	320	1000			
		2P3QFK	320	1000			
		2P3QYK	320	1000			
		2P3QSK	320	1000			
Peak Emission Wavelength	λP	2P3QRK		639		nm	Measurement @ peak (Fig.1)
		2P3QEK		632			
		2P3QHK		624			
		2P3QAK		621			
		2P3QFK		611			
		2P3QYK		595			
		2P3QSK		588			
Dominant Wavelength	λd	2P3QRK		631		nm	Note 5
		2P3QEK		624			
		2P3QHK		618			
		2P3QAK		615			
		2P3QFK		605			
		2P3QYK		592			
		2P3QSK		587			
Spectral Line Half-Width	△λ	2P3QRK		20		nm	
		2P3QEK		20			
		2P3QHK		18			
		2P3QAK		18			
		2P3QFK		17			
		2P3QYK		15			
		2P3QSK		15			
Forward Voltage	VF	2P3QRK		1.9	2.3	V	IF=20mA
		2P3QEK		2.0	2.4		
		2P3QHK		2.0	2.4		
		2P3QAK		2.0	2.4		
		2P3QFK		2.0	2.4		
		2P3QYK		2.0	2.4		
		2P3QSK		2.0	2.4		
Viewing Angle	2θ1/2			22		deg	Note 2 (Fig.5)
Reverse Current	IR				100	μA	VR=5V
Capacitance	C			40		pF	VF=0 f=1MHz

Notes:
1. Luminous intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve.
2. Luminous intensity rank classified products support two ranks.
3. $\theta_{1/2}$ is the off-axis angle at which the luminous intensity is half the axial luminous intensity.
4. Iv classification code is marked on each packing bag.
5. The dominant wavelength, λd is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.

Electrical / Optical Characteristics and Curves at Ta= 25℃

Parameter	Symbol	Part No. LTL	Min.	Typ.	Max.	Unit	Test Condition
Luminous Intensity	Iv	2R3QRK	180	500		mcd	IF=20mA Note 1 Note 2
		2R3QEK	180	700			
		2R3QHK	180	700			
		2R3QAK	180	700			
		2R3QFK	180	700			
		2R3QYK	180	700			
		2R3QSK	180	700			
Peak Emission Wavelength	λP	2R3QRK		639		nm	Measurement @ peak (Fig.1)
		2R3QEK		632			
		2R3QHK		624			
		2R3QAK		621			
		2R3QFK		611			
		2R3QYK		595			
		2R3QSK		588			
Dominant Wavelength	λd	2R3QRK		631		nm	Note 5
		2R3QEK		624			
		2R3QHK		618			
		2R3QAK		615			
		2R3QFK		605			
		2R3QYK		592			
		2R3QSK		587			
Spectral Line Half-Width	△λ	2R3QRK		20		nm	
		2R3QEK		20			
		2R3QHK		18			
		2R3QAK		18			
		2R3QFK		17			
		2R3QYK		15			
		2R3QSK		15			
Forward Voltage	VF	2R3QRK		1.9	2.3	V	IF=20mA
		2R3QEK		2.0	2.4		
		2R3QHK		2.0	2.4		
		2R3QAK		2.0	2.4		
		2R3QFK		2.0	2.4		
		2R3QYK		2.0	2.4		
		2R3QSK		2.0	2.4		
Viewing Angle	$2\theta_{1/2}$			30		deg	Note 2 (Fig.5)
Reverse Current	IR				100	μA	VR=5V
Capacitance	C			40		pF	VF=0 f=1MHz

Notes:
1. Luminous intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve.
2. Luminous intensity rank classified products support two ranks.
3. $\theta_{1/2}$ is the off-axis angle at which the luminous intensity is half the axial luminous intensity.
4. Iv classification code is marked on each packing bag.
5. The dominant wavelength, λd is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.

Typical Electrical / Optical Characteristic Curves (25℃ Ambient Temperature Unless Otherwise Noted)

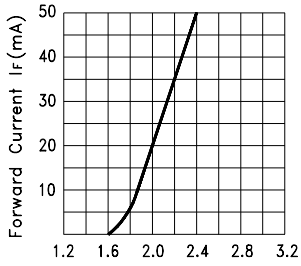


Fig.2 Forward Current vs. Forward Voltage

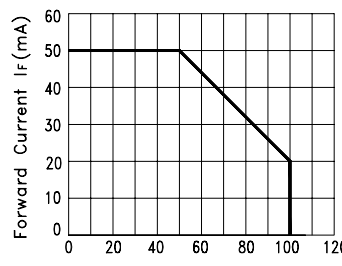


Fig.3 Forward Current Derating Curve

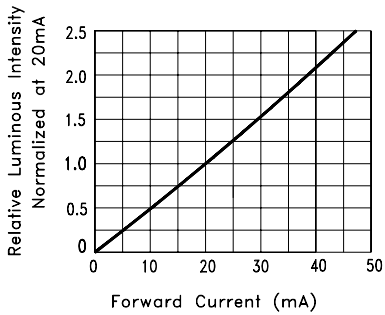


Fig.4 Relative Luminous Intensity vs. Forward Current

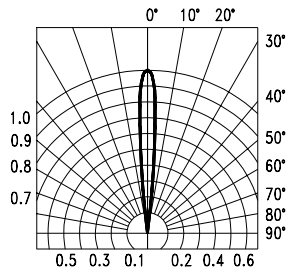


Fig.5-1 Spatial Distribution

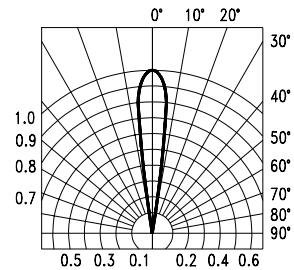


Fig.5-2 Spatial Distribution

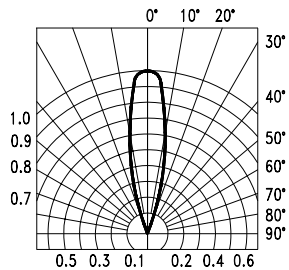


Fig.5-3 Spatial Distribution

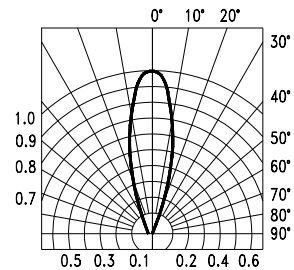


Fig.5-4 Spatial Distribution