

MSL-194B	MSL-194DR
MSL-194UB	MSL-194Y
MSL-194TG	MSL-194N
MSL-194UTG	MSL-194HR
MSL-194UG	MSL-194HG
MSL-194UYL	MSL-194G
MSL-194SO	MSL-194PG
MSL-194UOL	

Technical Data Chip LEDs

02/27/2002

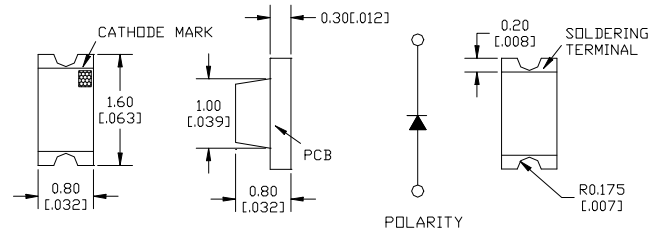
Features

- **Package** : 1.6×0.8×0.8mm (0603) standard package
- **Feature of the device** : extremely wide viewing angle;
ideal for backlighting and coupling in light guides
- **Wavelength** : 640 nm (red), 625 nm (red)
605 nm (orange), 590 nm (amber),
573nm (green), 525 nm (true green),
470 nm (blue)
- **Viewing angle** : Extremely Wide (130°)
- **Technology** : AlGaAs (red)
GaAsP (orange)
GaP (green, yellow)
AlInGaP (red, orange, amber, green)
InGaN (True green, blue)
- **Grouping parameter** : luminous intensity
- **Assembly methods** : suitable for all SMT assembly methods
- **Soldering methods** : IR reflow soldering
- **Preconditioning** : acc. to JEDEC Level 2
- **Taping** : 8-mm tape with 4000/reel, φ180mm

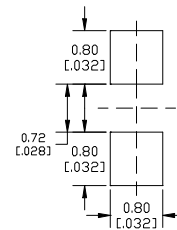
Applications

- **Automotive** : Dashboards , stop lamps , turn signals
- **Backlighting** : LCDs , Key pads , advertising
- **Status indicators** : Consumer & industrial electronics

Package Dimensions

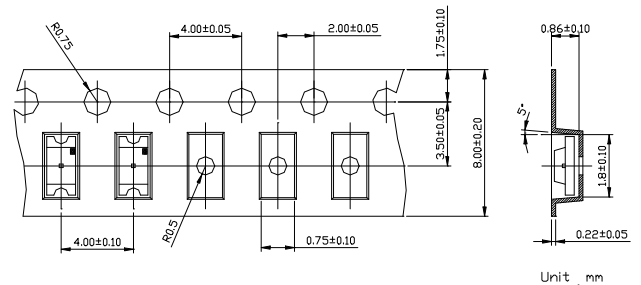


Recommended Solder Patterns



Method of Taping / Polarity and Orientation

Packing unit 3000/reel



Notes :

1. All dimensions are in millimeters (inches)

Selection Guide

Part Number	Color of Emission	Lens Color	Luminous Intensity I_V (mcd) @ 20mA
MSL-194B	Blue	Water clear	28
MSL-194UB	Blue		40
MSL-194TG	True Green		60
MSL-194UTG	True Green		150
MSL-194UG	Green		40
MSL-194UYL	Amber		50
MSL-194SO	Orange		60
MSL-194UOL	Red		50
MSL-194DR	Red		22.5
MSL-194Y	Yellow		12
MSL-194N	Amber		12
MSL-194HR	Red		12
MSL-194HG	Green		14.5
MSL-194G	Yellow Green		6.5
MSL-194PG	Pure Green		4.5

Luminous Intensity Groups

A :	1.801 ~ 3.111
B :	2.546 ~ 4.400
C :	3.601 ~ 6.222
D :	5.091 ~ 8.800
E :	7.201 ~ 12.443
F :	10.182 ~ 17.600
G :	14.401 ~ 24.886
H :	20.363 ~ 35.200
I :	28.801 ~ 49.773
J :	40.724 ~ 70.400
K :	57.601 ~ 99.546
L :	81.447 ~ 140.800
M :	115.201 ~ 199.091
N :	162.894 ~ 281.600
O :	230.401 ~ 398.182
P :	325.787 ~ 563.200
Q :	460.801 ~ 796.365
R :	651.572 ~ 1,126.400
S :	921.601 ~ 1,592.730
T :	1,303.143 ~ 2,252.800
U :	1,843.201 ~ 3,185.459
V :	2,606.286 ~ 4,505.600

Unit : mcd

Maximum Ratings

Parameter	Symbol	Value			Unit
		UOL,SO UYL,UG	B,UB TG,UTG	HG,G,PG DR,Y,N,HR	
Operating Temp. range	T_{OP}	-30 ~ +85			°C
Storage Temp. range	T_{stg}	-40 ~ +100			°C
Junction temperature	T_j	95			°C
Forward current	I_F	30		25	mA
Surge current $t \leq 1\text{m sec, Duty} \leq 1/20$	I_{FM}	100 48 (UG)	48	60	mA
Reverse Voltage	V_R	5			V
Power dissipation	P_{tot}	78	120	57	mW

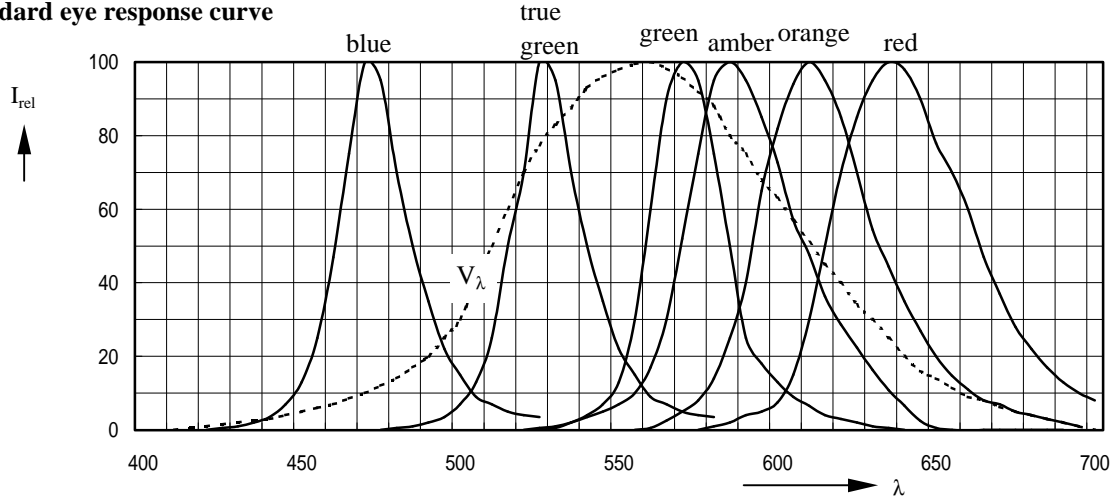
Optical Characteristics at $T_A=25^\circ\text{C}$

Part Number	Luminous Intensity I_V (mcd) @ 20mA		Peak Wavelength l peak (nm)	Color, Dominant Wavelength l d (nm)	Viewing Angle 2q 1/2 (Degrees)	Temperature Coefficient of V_F @ $I_F=20\text{mA}$, T_{cv} (mV/K)	Spectral Bandwidth at 50% Irel max (nm)
	Min.	Typ.	Typ.	Typ.	Typ.		
MSL-194B	10	28	468	470	130	-2.6	26
MSL-194UB	15	40	468	470	130	-2.6	26
MSL-194TG	30	60	523	525	130	-3.1	36
MSL-194UTG	70	150	518	525	130	-3.1	35
MSL-194UG	25	40	575	573	130	-2.6	16
MSL-194UYL	25	50	590	590	130	-2.3	16
MSL-194SO	30	60	610	605	130	-2.3	20
MSL-194UOL	25	50	630	625	130	-2.3	20
MSL-194DR	10	22.5	660	640	130	-2.5	20
MSL-194Y	5	12	583	585	130	-1.7	32
MSL-194N	5	12	620	607	130	-1.7	35
MSL-194HR	5	12	630	618	130	-2.0	35
MSL-194HG	5	14.5	568	570	130	-1.4	30
MSL-194G	1.5	6.5	568	570	130	-1.4	30
MSL-194PG	1.5	4.5	555	557	130	-1.4	25

Device Type	Forward Voltage V_F (Volts) @ $I_F = 20\text{mA}$		Reverse Current I_R (μA) @ $V_R = 5\text{V}$
	Typ.	Max	Max
MSL-194B	3.3	4.0	100
MSL-194UB	3.7	4.2	100
MSL-194TG	3.3	4.0	100
MSL-194UTG	3.7	4.2	100
MSL-194UG	2.0	2.6	100
MSL-194UYL	2.0	2.6	100
MSL-194SO	2.0	2.6	100
MSL-194UOL	2.0	2.6	100
MSL-194DR	1.8	2.6	100
MSL-194Y	2.1	2.7	100
MSL-194N	2.1	2.7	100
MSL-194HR	1.8	2.3	100
MSL-194HG	2.2	2.7	100
MSL-194G	2.2	2.7	100
MSL-194PG	2.2	2.7	100

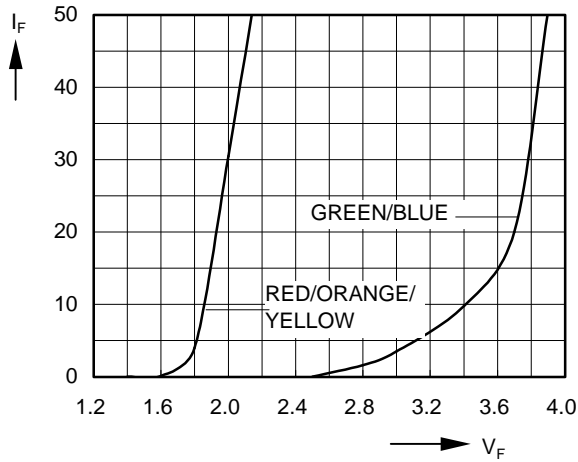
Relative spektrale Emission $I_{rel} = f(\lambda)$, $T_A = 25^\circ\text{C}$, $I_F = 10\text{mA}$

$V(\lambda) =$ Standard eye response curve



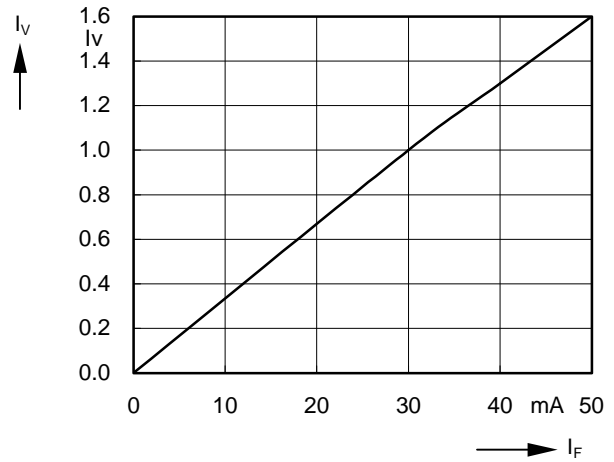
Forward Current $I_F = f(V_F)$

$T_A = 25^\circ\text{C}$

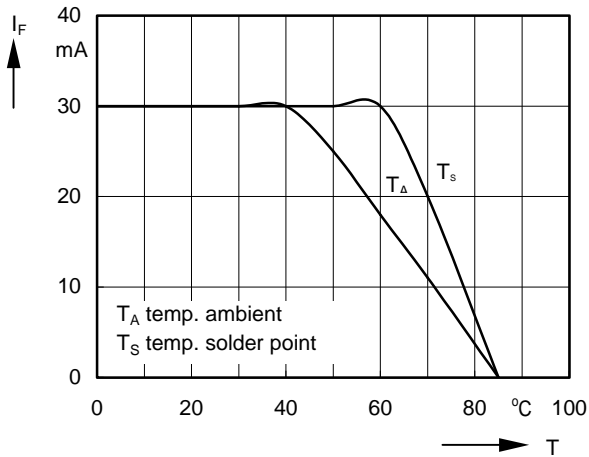


Relative Luminous Intensity $I_V/I_V(10\text{mA}) = f(I_F)$

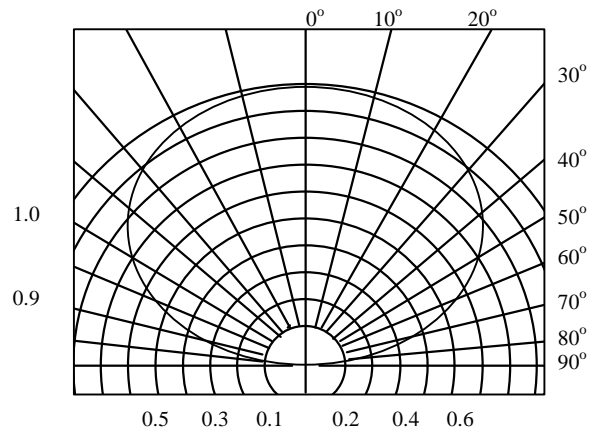
$T_A = 25^\circ\text{C}$



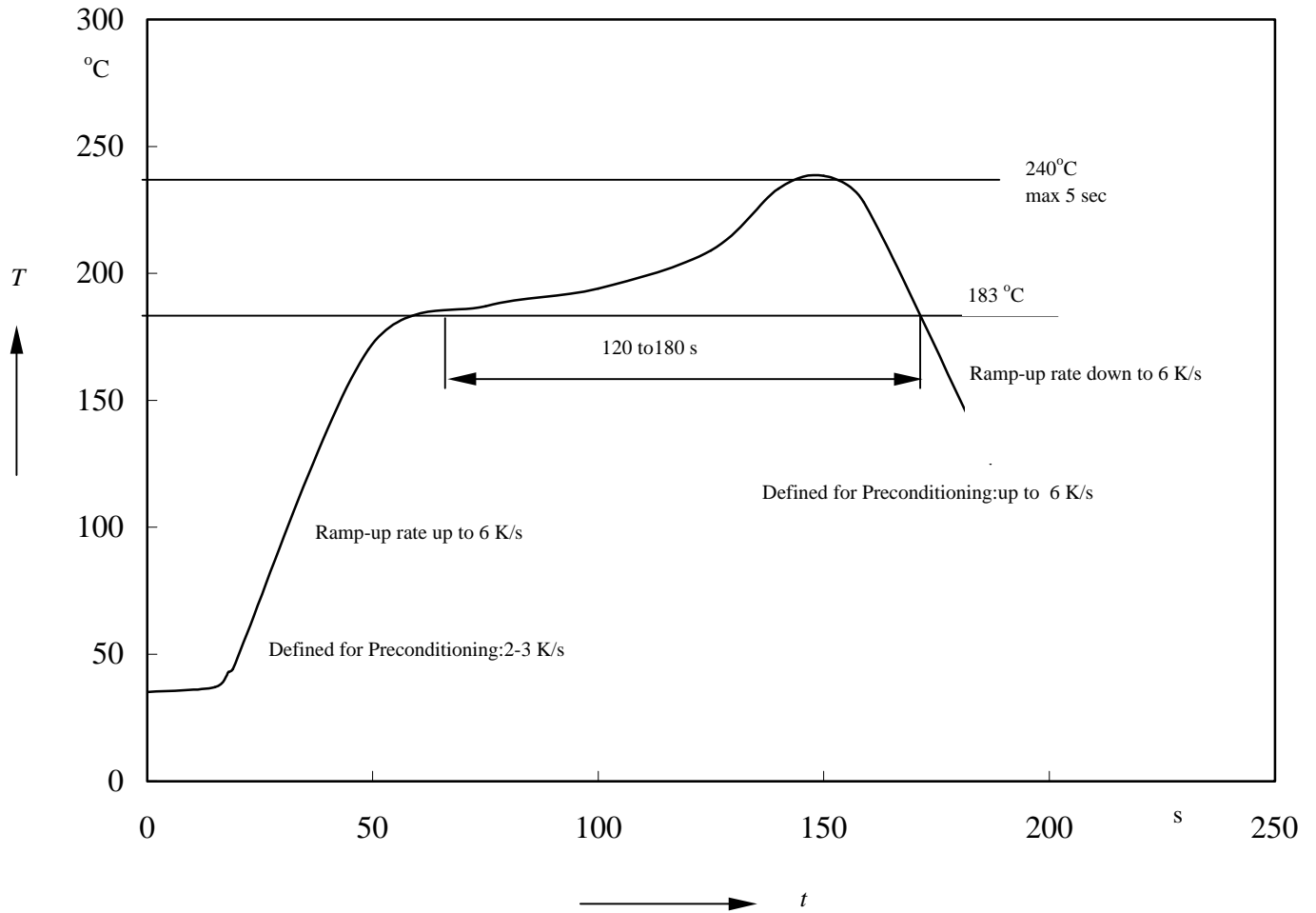
Max. Permissible Forward Current $I_F = f(T_A)$



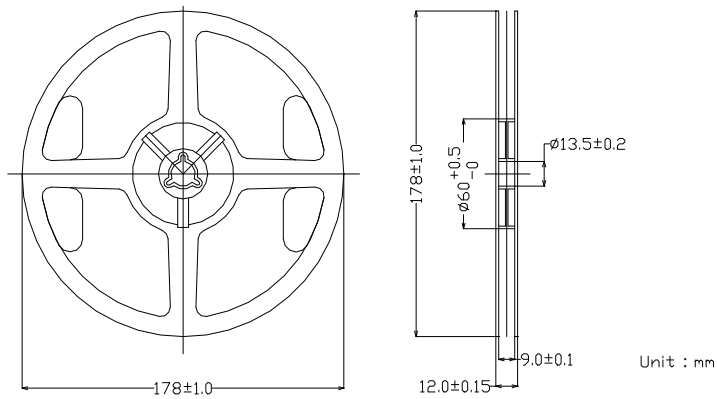
Radiation Characteristic $I_{rel} = f(j)$



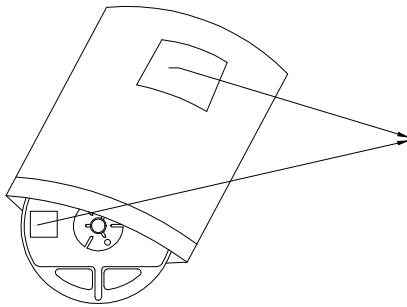
IR Reflow Soldering Profile



Package Dimensions of Reel



Packaging

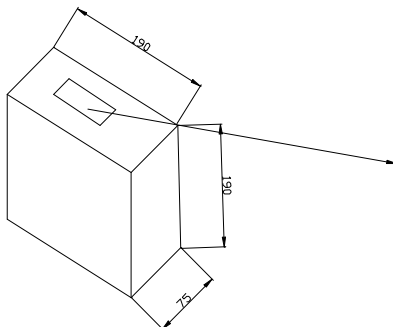


Product lable

CUSTOMER:
 CUSTOMER P/N:
 DEVICE TYPE:
 BIN:
 COLOR RANK:
 LOT NO:
 Q'TY:

CAUTION : After open the aluminum laminate bag the lamps should be storage in the follow condition
 Temperaure : 5 to 30°C ; Humidity : 70% ; Storage time : 72hrs max
 Backing condition : If backing is necessary, we recommended the backing condition is 60 +/- 5°C 10hours

Packing



Product lable

CUSTOMER:
 CUSTOMER P/N:
 DEVICE TYPE:
 BIN:
 COLOR RANK:
 LOT NO:
 Q'TY: