

Classification of Components

Classification of SMD LEDs TLM.31../TLM.32../TLM.33../ + 30...-series, Mini LEDs TLM.21... / TLM.23.. / TLM.20.. and 0603 LEDs TLM.11../TLM10..

Light Intensity / Color

Devices are classified in light intensity and wavelength groups, describing Min./Max. limits by an alphanumeric code. These groups are not order codes. The group limits include all measurement tolerances and every packing unit includes one group only, unless specified otherwise.

Group	Light Intensity [mcd]			
	Standard	Optional	Min	Max
L	a		1	1.6
	b		1.25	2
M	a		1.6	2.5
	b		2	3.2
N	a		2.5	4
	b		3.2	5
P	a		4	6.3
	b		5	8
Q	a		6.3	10
	b		8	12.5
R	a		10	16
	b		12.5	20
S	a		16	25
	b		20	32
T	a		25	40
	b		32	50
U	a		40	63
	b		50	80
V	a		63	100
	b		80	125
W	a		100	160
	b		125	200
X	a		160	250
	b		200	320
Y	a		250	400
	b		320	500
Z	a		400	630
	b		500	800
0	a		630	1000
	b		800	1250
1	a		1000	1600
	b		1250	2000
2	a		1600	2500
	b		2000	3200

Standard: matching factor

$$I_{Vmin} / I_{Vmax} = 1 : 2$$

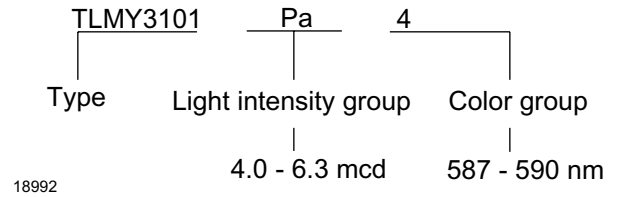
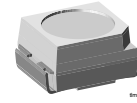


Figure 1. Example for labelling of components and packing materials

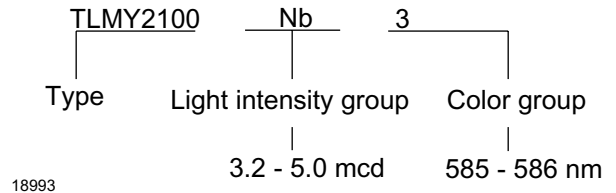
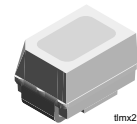
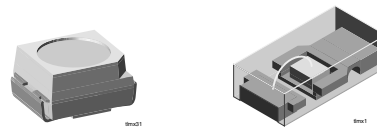


Figure 2. Example for labelling of components and packing materials

Color Classification of SMD LED's , MiniLED and 0603 LED

Light Intensity / Color

Devices are classified in light intensity and wavelength groups, describing Min./Max. limits by an alphanumeric code. These groups are not order codes. The group limits include all measurement tolerances and every packing unit includes one group only, unless specified otherwise.



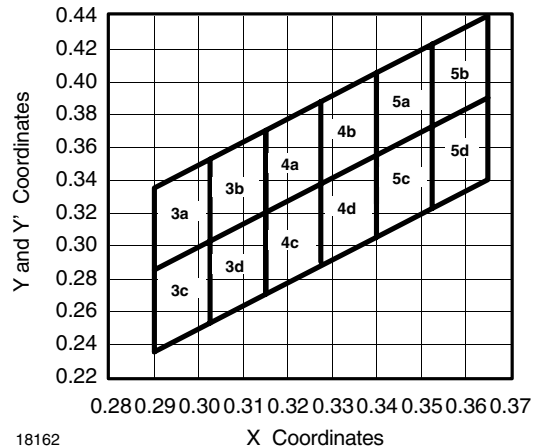
Group	Yellow		Green	
	Dom. wavelength [nm]			
	Min.	Max.	Min.	Max.
0				
1	581	584		
2	583	586		
3	585	588		
4	587	590	564	567
5	589	592	566	569
6	591	594	568	571
7			570	573
8			572	575

Group	Softorange		Pure green	
	Dom. wavelength [nm]			
	Min.	Max.	Min.	Max.
0			555	559
1	598	601	558	561
2	600	603	560	563
3	602	605	562	565
4	604	607		
5	606	609		
6	608	611		

Group	Blue	
	Dom. wavelength [nm]	
	Min.	Max.
2	458	464
3	462	468
4	466	472
5	470	476
6	474	480

Group	Bluegreen		Truegreen	
	Dom. wavelength [nm]			
	Min.	Max.	Min.	Max.
2	492	498	509	517
3	496	502	515	523
4	500	506	521	529
5	504	510	527	535
6	508	514	533	541

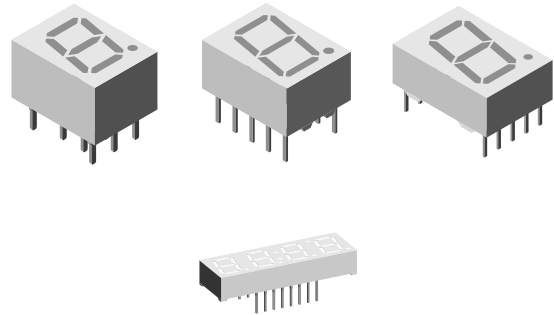
Group	White			
	x		y	
	Chromaticity Coordinates acc. to CIE 1931			
	Min.	Max.	Min.	Max.
3a	0.2900	0.3025	$Y = 1.4x - 0.121$	$Y = 1.4x - 0.071$
3b	0.3025	0.3150	$Y = 1.4x - 0.121$	$Y = 1.4x - 0.071$
3c	0.2900	0.3025	$Y = 1.4x - 0.171$	$Y = 1.4x - 0.121$
3d	0.3025	0.3150	$Y = 1.4x - 0.171$	$Y = 1.4x - 0.121$
4a	0.3150	0.3275	$Y = 1.4x - 0.111$	$Y = 1.4x - 0.071$
4b	0.3275	0.3400	$Y = 1.4x - 0.111$	$Y = 1.4x - 0.151$
4c	0.3150	0.3275	$Y = 1.4x - 0.151$	$Y = 1.4x - 0.111$
4d	0.3275	0.3400	$Y = 1.4x - 0.151$	$Y = 1.4x - 0.111$
5a	0.3400	0.3525	$Y = 1.4x - 0.111$	$Y = 1.4x - 0.071$
5b	0.3525	0.3650	$Y = 1.4x - 0.111$	$Y = 1.4x - 0.071$
5c	0.3400	0.3525	$Y = 1.4x - 0.151$	$Y = 1.4x - 0.111$
5d	0.3525	0.3650	$Y = 1.4x - 0.151$	$Y = 1.4x - 0.111$



Classification of Displays

Light Intensity / Color

Devices are classified in light intensity and wavelength groups, describing Min./Max. limits by an alphanumeric code. These groups are not order codes. The group limits include all measurement tolerances and every packing unit includes one group only, unless specified otherwise.



Classification of 7-Segment Display and Clock Modules

Group	Light Intensity μcd	
	Min.	Max.
C	70	140
D	110	220
E	180	360
F	280	560
G	450	900
H	700	1400
I	1100	2200
K	1800	3600
L	2800	5600
M	4500	9000
N	7000	14000

Group	Softorange		Pure green	
	Dom. wavelength [nm]			
	Min.	Max.	Min.	Max.
0			555	559
1	598	601	558	561
2	600	603	560	563
3	602	605	562	565
4	604	607		
5	606	609		
6	608	611		

Group	Yellow		Green	
	Dom. wavelength [nm]			
	Min.	Max.	Min.	Max.
0				
1	581	584		
2	583	586		
3	585	588		
4	587	590	564	567
5	589	592	566	569
6	591	594	568	571
7			570	573
8			572	575

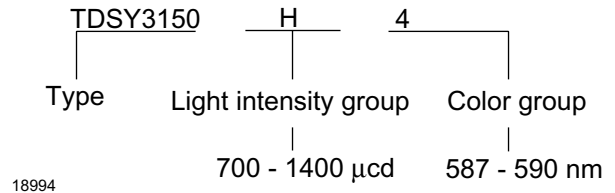
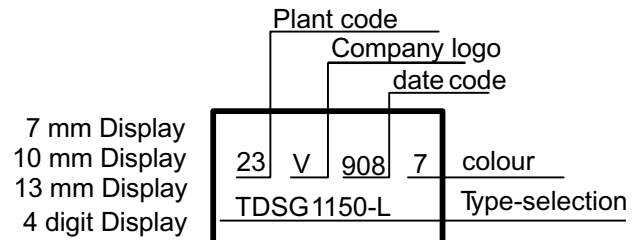


Figure 3. Example for labelling of components and packing materials

Marking on Displays

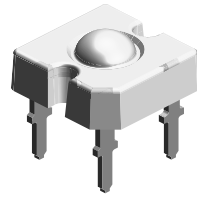


18987

Classification of TELUX™

Luminous Flux / Color

Devices are classified in luminous flux and wave-length groups, describing Min./Max. limits by an alphanumeric code. These groups are not order codes. The group limits include all measurement tolerances and every packing unit includes one group only, unless specified otherwise.



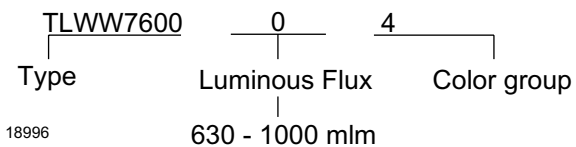
Luminous Flux Classification

Tolerance ± ...%

Group	Luminous Flux [mlm]	
	Min.	Max.
9	80	125
8	100	160
7	125	200
6	160	250
5	200	320
4	250	400
3	320	500
2	400	630
1	500	800
0	630	1000
A	800	1250
B	1000	1800
C	1500	2400
D	2000	3000
E	2500	3600
F	3000	4200
G	3500	4800
H	4000	6100
I	5000	7300
K	6000	9700
L	7000	12200
M	8000	15000

Forward Voltage Classification

Group	Forward Voltage [V]	
	Min.	Max.
Y	1.83	2.07
Z	1.95	2.19
0	2.07	2.31
1	2.19	2.43
2	2.31	2.55
3	2.43	2.67
4	2.55	2.79



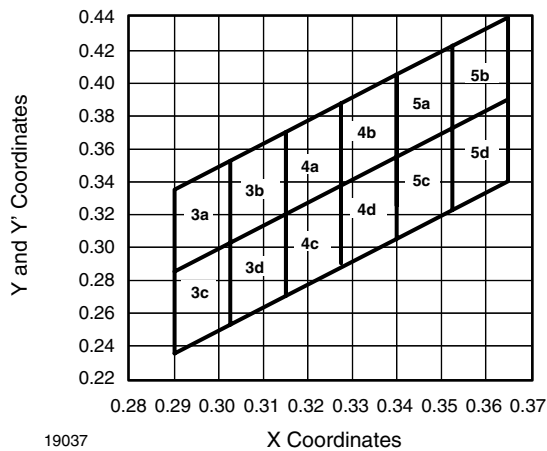
Color Classification

Group	Red		Yellow	
	Dom. Wavelength [nm]			
	Min.	Max.	Min.	Max.
0			585	588
1	611	618	587	591
2	614	622	589	594
3	616	634	592	597

Group	Softorange	
	Dom. wavelength [nm]	
	Min.	Max.
0		
1	598	601
2	600	603
3	602	605
4	604	607
5	606	609
6	608	611

Group	Bluegreen		Truegreen	
	Dom. wavelength [nm]			
	Min.	Max.	Min.	Max.
2	492	498	509	517
3	496	502	515	523
4	500	506	521	529
5	504	510	527	535
6	508	514		

Group	Blue	
	Dom. wavelength [nm]	
	Min.	Max.
2	458	464
3	462	468
4	466	472
5	470	476
6	474	480

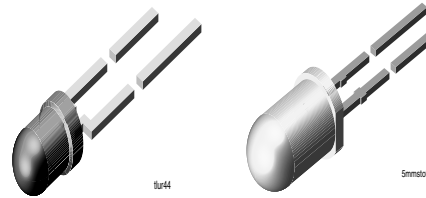


Vishay Semiconductors

Classification of LEDs

Light Intensity / Luminous Flux / Color

LEDs are classified in light intensity / luminous flux and wavelength groups, describing Min./Max. limits by an alphanumeric code. These groups are not order codes. The group limits include all measurement tolerances and every packing unit includes one group only, unless specified otherwise.



Classification of 3 and 5 mm LEDs

Group	Light Intensity [mcd] / Luminous Flux [lm]	
	Min	Max
	F	0.1
G	0.16	0.32
H	0.25	0.5
I	0.4	0.8
K	0.63	1.25
L	1.0	2.0
M	1.6	3.2
N	2.5	5.0
P	4.0	8.0
Q	6.3	12.5
R	10	20
S	16	32
T	25	50
U	40	80
V	63	125
W	100	200
X	130	260
Y	180	360
Z	240	480
AA	320	640
BB	430	860
CC	575	1150
DD	750	1500
EE	1000	2000
FF	1350	2700
GG	1800	3600
HH	2400	4800
II	3200	6400
KK	4300	8600
LL	5750	11500
MM	7500	15000
NN	10000	20000
PP	13500	27000
QQ	18000	36000
RR	24000	48000
SS	32000	64000
TT	43000	86000
UU	57500	115000

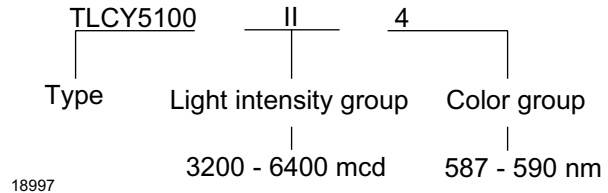


Figure 4. Example for labelling of components and packing materials



Color Classification for 3 and 5 mm LED's

Group	Yellow		Green	
	Dom. wavelength [nm]			
	Min.	Max.	Min.	Max.
0				
1	581	584		
2	583	586		
3	585	588		
4	587	590	564	567
5	589	592	566	569
6	591	594	568	571
7			570	573
8			572	575
9			574	577

Group	Bluegreen		Truegreen	
	Dom. wavelength [nm]			
	Min.	Max.	Min.	Max.
2	492	498	509	517
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Group	Softorange		Pure green	
	Dom. wavelength [nm]			
	Min.	Max.	Min.	Max.
0			555	559
1	598	601	558	561
2	600	603	560	563
3	602	605	562	565
4	604	607	564	567
5	606	609		
6	608	611		

Group	Blue	
	Dom. wavelength [nm]	
	Min.	Max.
2	458	464
3	462	468
4	466	472
5	470	476
6	474	480

Group	White			
	x		y	
	Chromaticity Coordinates acc. to CIE 1931			
	Min.	Max.	Min.	Max.
3	0.280	0.325	0.210	0.340
4	0.305	0.350	0.260	0.390
5	0.330	0.375	0.310	0.440