Featured Products





Easily distinguishable even for various types of colorblindness

Color Universal Design Compatible 1608(0603)Size LEDs

Industria

General Purpose

opliance

SMLD12BN1W/SMLD12E2N1W/SML-D15DW

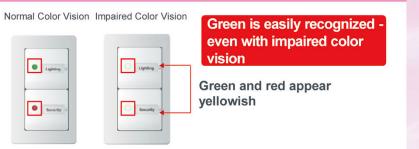
- Achieves superior visibility with respect to different types of color vision
- Offered in the industry-standard 1608 (1603) size

What is Color Universal Design (CUD)?

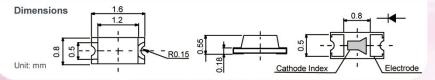
A design system to ensure that information is accurately conveyed even to people with color deficiencies

Color blindness often causes a number of inconveniences in daily life, and can even lead to serious injuries and/or death (i.e. when overlooking a warning lamp). CUD involves designing color schemes and measures to minimize or eliminate these inconveniences and allow even those who are colorblind to receive correct information.

Differences in Color Vision



High Precision 1608 Package with High Reliability Resin



Applications

■ Indicators (home appliances, ■ Office equipment ■ Automotive medical systems)

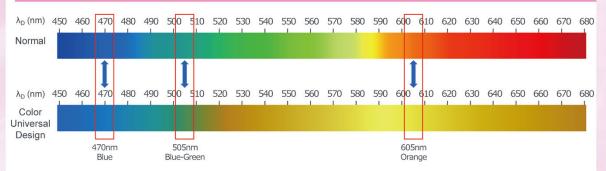
SML



Specifications

Part No.	Color	I _v (mcd)	$\lambda_{\rm D}({\rm nm})$	$V_{F}(V)$	I _F (mA)			
SMLD12BN1W	Blue	40	470	2.9	5 5			
SMLD12E2N1W	Blue-Green	120	505	2.9				
SML-D15DW	Orange	224	605	2.0	20			

Color Universal Design Example



Normal color schemes call for blue (470nm), green (530nm), and red (630nm), but it is often difficult for colorblind people to discriminate between green and red. In response, Color Universal Design utilizes blue (470nm), blue-green (505nm), and orange (605nm) that are more easily distinguishable by people with various types of colorblindness.

1608 (0603) Size LED Lineup

Models that support Universal Color Design

ſ				num Ratings	Electro-Optical Characteristics (Ta=25°C)													
- 1			Peak					Forward Reverse Emission Wavelength λ						Long and Long			Automotive	
- 1	Part No.	Color	Permissible	Forward	Forward	Reverse	Operating	Storg age Temp.	Voltage V _F		Current I _R		D/Chromaticity (x,y)		Luminosity I _v			Grade
- 1			Loss	Current	Current	Voltage	Temp.	Tstg(°C)	Тур.	lF	Max.	V _R	Typ.*	IF	Min.	Тур.	I _F	AEC-Q101
- 1			P _D (mW)	I _F (mA)	I _{FP} (mA)	V _R (V)	Topr(°C)		(V)	(mA)	(µA)	(V)	(nm)	(mA)	(mcd)	(mcd)	(mA)	
1	SML-D12W 8W (A)	Yellow	52	20	100* ²	12	-40 to +100	-40 to + 100	2.0	2	10	12	588	2	5	7	2	YES
h	SML-D12V1W				100		1010 1100	1010 1100					630		25	40		
t	SML-D12U1W	Red											620		40	63		
t	SML-D12D1W	Orange	54	20	100* ²	5	-40 to +85	-40 to + 100	2.2	20	10	5	605	20	63	100	20	—
Ī	SML-D12Y1W	Yellow	(590					
1		Yellow-											570		10			
	SML-D12M1W	Green											572		16	30		
[SML-D12V8W	Red											630		16	40		YES
[SML-D12U8W	Reu								_			620		25	63		TES
[SML-D12D8W	Orange											605		40	100		
- [SML-D12Y8W	Yellow	54	20					2.2	20	10	5	590	20	25	63	20	
	SML-D12Y3W		~	20					2.2	20	.0	3	581	20	16	40	20	_
	SML-D12M8W	Yellow-			100* ²	5	-40 to +85	-40 to +100					572		10	25		YES
		Green			100	Ŭ	10 10 1 00	40101100							10.00	1000		.20
_	SML-D12P8W												560		3	6		
_	SML-D12FW	Green	67	25									565		14	18		-
_	☆ SMLD12EN1W		70				-40 to +100		3.0			12	527		56	140		
	☆ SMLD12E2N1W	Blue-	66	20			-40 to +85		2.9	5		5	505	5	- 56	120	5	(YES)
⇒	☆ SMLD12E3N1W	Green							10000			197	496		56	85		. ,
	☆ SMLD12BN1W	Blue					$-40 \sim +100$				10		470		- 14	40		
	SMLD12W BN1W	White								-			(x,y)(0.295,0.280)	-	56	120		
ł	SML-D13VW (A)	Red	72						2.0				630		36	55		
H	SML-D13UW (A)	0	12	20					2.0		_		620 605		56	85		YES
H	SML-D13DW (A) SML-D13W W (A)	Orange Yellow		30									587		71	120 110		TES
H	SIVIL-DISVV VV (A)	Yellow-									_		100			110		
- 1	SML-D13MW (A)	Green	75						2.1				571		28	45		
ł	SML-D13U8W	Red	52	20	100* ²	5	-40 to +100	-40 to + 100		20	10	5	620	20	40	70	20	
	SML-D13Y8W		54	20	100	5	4010 1 100	40101100	2.2	20	10	5	590	20	63	100	20	
	SML-D13Y2W	Yellow	78	30					2.1				581		40	80		-
		Yellow-																
	SML-D13M8W	Green	52	20					2.2				572		16	30		
t	SML-D13FW	Green	81	30					2.1				565		18	22		YES
1	SML-D14VW (A)	Red	72						2				630		71	100		
1	SML-D14U2W (A)	Rea							2				615		90	160		
-	SML-D14DW (A)	Orange											605			200		
	SML-D14YW (A)	Yellow	75	30	100* ²	5	-40 to +100	-40 to $+100$	2.1	20	10	5	590	20	112		20	YES
	SML-D14WW(A)	Tenow	75						2.1				587			180		
	SML-D14MW (A)	Yellow- Green											571		36	60		
1	SML-D15VW												630		71	90		
1	SML-D15UW	Red	84										620		90	112		
⇒	SML-D15U2W								2				615		112	140		
	SML-D15DW	Orange		35	100* ²	5	-40 to +100	-40 to + 100		20	- 10	5	605	20	180	224	20	YES
	SML-D15YW	Yellow							2.1				590					
	SML-D15MW	Yellow- Green	87										571		56	71		
	*1: Duty1/5 200Hz *2	D.++4/40	41-11- *0. Dut	100 4-	*4. Dutu		*E.D.+. < 4/40	mula a suidite la a d	h = = 10==	-				1		and some last	. I lealer	Development

*1: Duty1/5, 200Hz *2: Duty1/10, 1kHz *3: Duty≦1/20, 1ms *4: Duty≦1/5, 1kHz *5:Duty≦1/10, pulse width less than 10ms

*: White is expressed in chromaticity coordinates (x,y)

Note: Automotive-grade products (AEC-Q101) will include a 'C' in the part number (YES): Planned

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The content specified in this document is correct as of March 1st, 2018.