

OSRAM KW DELSS2.CC

Datasheet

Published by **ams-OSRAM AG**

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OSTUNE® E1608

KW DELSS2.CC

OSTUNE® is ams OSRAM' brand family for automotive qualified LEDs offering superior light quality for ambient white illumination.

OSTUNE® allows excellent color rendering by using dedicated phosphors with high CRI from very cold white to very warm white color temperatures.

Thanks to OSTUNE® E1608 customers benefit from high quality of white at a very small package size.



Applications

- Ambient Lighting
- Automotive Aftermarket

Features

- Package: white SMT package, colored diffused silicone resin
- Chip technology: EPI_Sapphire
- Typ. Radiation: 120° (Lambertian emitter)
- Color: Cx = 0.42, Cy = 0.39 acc. to CIE 1931 (● warm white)
- Qualifications: AEC-Q102 Qualified
- Color temperature: 2700K - 6500K
- CRI: 90 (min.)
- ESD: 2 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)
- Very small color and brightness bins
- Supports single and multi light point applications (matrix)

Ordering Information

Type	Color temperature	Luminous Intensity ¹⁾ $I_F = 30 \text{ mA}$ I_v	Ordering Code
KW DELSS2.CC-BXCY-4U9X-46A8	2700 K	1800 ... 3900 mcd	Q65112A9449
KW DELSS2.CC-BXCY-4R9T-46A8	3000 K	1800 ... 3900 mcd	Q65112A9451
KW DELSS2.CC-BXCY-4O9Q-46A8	3500 K	1800 ... 3900 mcd	Q65112A9450
KW DELSS2.CC-BXCY-4L8N-46A8	4000 K	1800 ... 3900 mcd	Q65113A1206
KW DELSS2.CC-BXCY-4J8K-46A8	4500 K	1800 ... 3900 mcd	Q65113A1205
KW DELSS2.CC-BXCY-4H8I-46A8	5000 K	1800 ... 3900 mcd	Q65112A9448
KW DELSS2.CC-BXCY-4F8G-46A8	5700 K	1800 ... 3900 mcd	Q65112A9447
KW DELSS2.CC-BXCY-4C6E-46A8	6500 K	1800 ... 3900 mcd	Q65112A9446

Maximum Ratings

Parameter	Symbol		Values
Operating Temperature	T_{op}	min. max.	-40 °C 110 °C
Storage Temperature	T_{stg}	min. max.	-40 °C 110 °C
Junction Temperature	T_j	max.	125 °C
Forward current $T_s = 25\text{ °C}$	I_F	min. max.	1 mA 33 mA
Forward current pulsed $D = 0.005$; $T_s = 25\text{ °C}$	$I_{F\ pulse}$	max.	40 mA
Surge current $t \leq 10\ \mu s$; $D = 0.005$; $T_s = 25\text{ °C}$	I_{FS}	max.	40 mA
Reverse voltage ²⁾ $T_s = 25\text{ °C}$	V_R	max.	5 V
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)	V_{ESD}		2 kV

Characteristics

$I_F = 30 \text{ mA}$; $T_s = 25 \text{ °C}$

Parameter	Symbol		Values
Chromaticity Coordinate ³⁾	C_x	typ.	0.42
	C_y	typ.	0.39
Viewing angle at 50% I_V	2ϕ	typ.	120 °
Forward Voltage ⁴⁾ $I_F = 30 \text{ mA}$	V_F	min.	2.90 V
		typ.	3.20 V
		max.	3.60 V
Reverse current ²⁾ $V_R = 5 \text{ V}$	I_R	typ.	0.01 μA
		max.	10 μA
Color Rendering Index	CRI	min.	90
Real thermal resistance junction/solderpoint ⁵⁾	$R_{thJS \text{ real}}$	typ.	120 K / W
		max.	210 K / W

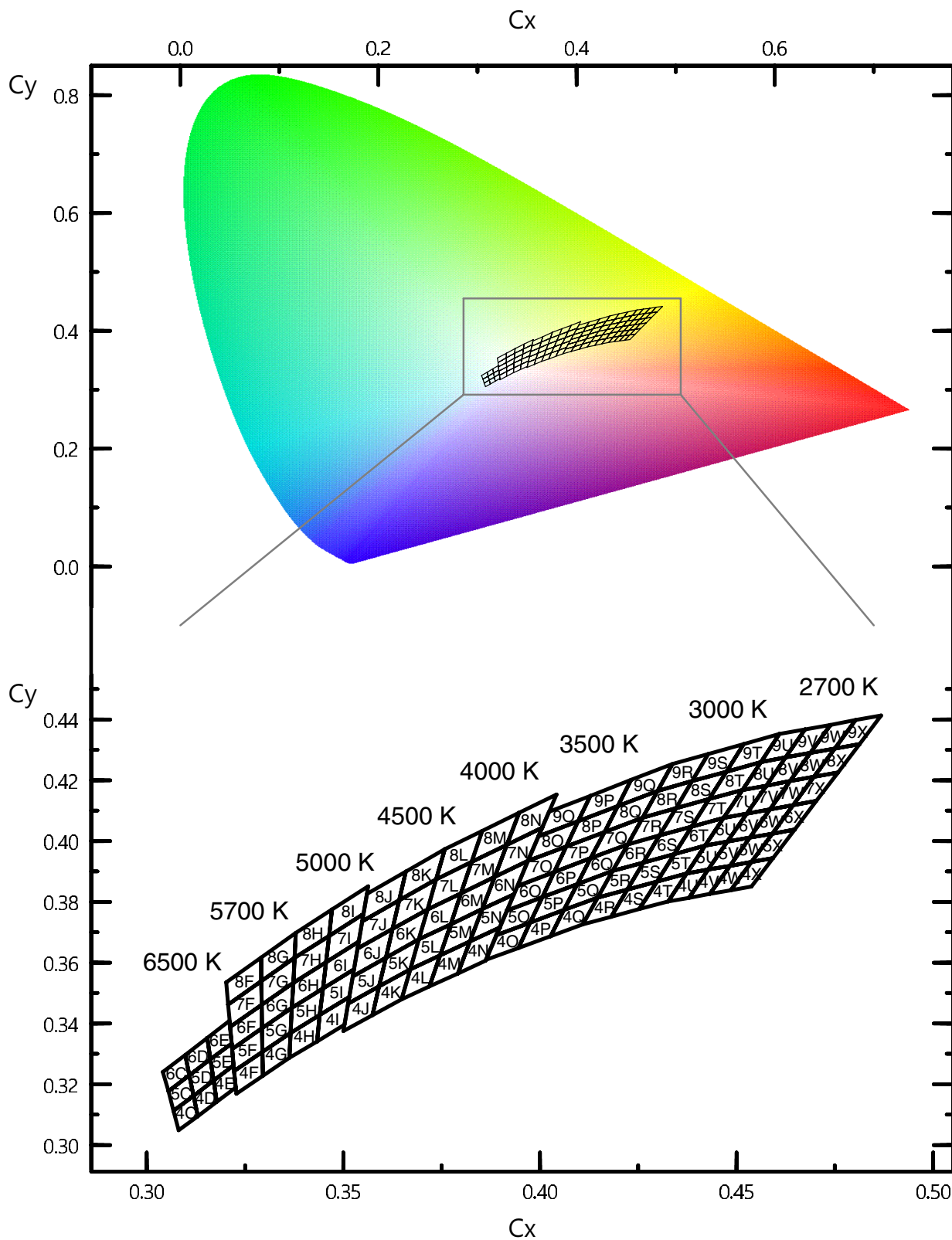
Brightness Groups

Group	Luminous Intensity ¹⁾ $I_F = 30 \text{ mA}$ min. I_v	Luminous Intensity ¹⁾ $I_F = 30 \text{ mA}$ max. I_v	Luminous Flux ⁶⁾ $I_F = 30 \text{ mA}$ typ. Φ_v
BX	1800 mcd	2100 mcd	5850 mlm
BY	2100 mcd	2400 mcd	6750 mlm
BZ	2400 mcd	2800 mcd	7800 mlm
CX	2800 mcd	3300 mcd	9150 mlm
CY	3300 mcd	3900 mcd	10800 mlm

Forward Voltage Groups

Group	Forward Voltage ⁴⁾ $I_F = 30 \text{ mA}$ min. V_F	Forward Voltage ⁴⁾ $I_F = 30 \text{ mA}$ max. V_F
46	2.90 V	3.20 V
A8	3.20 V	3.60 V

Chromaticity Coordinate Groups



Chromaticity Coordinate Groups ³⁾

Group	Cx	Cy	CCT	Group	Cx	Cy	CCT	Group	Cx	Cy	CCT
4U	0.4326	0.3801	2700	6U	0.4420	0.3985	2700	8U	0.4515	0.4168	2700
	0.4373	0.3893	2700		0.4468	0.4077	2700		0.4562	0.4260	2700
	0.4428	0.3906	2700		0.4526	0.4090	2700		0.4625	0.4275	2700
	0.4379	0.3814	2700		0.4477	0.3998	2700		0.4576	0.4183	2700
4V	0.4379	0.3814	2700	6V	0.4477	0.3998	2700	8V	0.4576	0.4183	2700
	0.4428	0.3906	2700		0.4526	0.4090	2700		0.4625	0.4275	2700
	0.4483	0.3919	2700		0.4585	0.4104	2700		0.4688	0.4290	2700
	0.4432	0.3826	2700		0.4534	0.4011	2700		0.4636	0.4197	2700
4W	0.4432	0.3826	2700	6W	0.4534	0.4011	2700	8W	0.4636	0.4197	2700
	0.4483	0.3919	2700		0.4585	0.4104	2700		0.4688	0.4290	2700
	0.4538	0.3931	2700		0.4644	0.4118	2700		0.4750	0.4304	2700
	0.4485	0.3838	2700		0.4591	0.4025	2700		0.4697	0.4211	2700
4X	0.4485	0.3838	2700	6X	0.4591	0.4025	2700	8X	0.4697	0.4211	2700
	0.4538	0.3931	2700		0.4644	0.4118	2700		0.4750	0.4304	2700
	0.4593	0.3944	2700		0.4703	0.4132	2700		0.4813	0.4319	2700
	0.4538	0.3850	2700		0.4648	0.4038	2700		0.4758	0.4225	2700
5U	0.4373	0.3893	2700	7U	0.4468	0.4077	2700	9U	0.4562	0.4260	2700
	0.4420	0.3985	2700		0.4515	0.4168	2700		0.4609	0.4352	2700
	0.4477	0.3998	2700		0.4576	0.4183	2700		0.4674	0.4367	2700
	0.4428	0.3906	2700		0.4526	0.4090	2700		0.4625	0.4275	2700
5V	0.4428	0.3906	2700	7V	0.4526	0.4090	2700	9V	0.4625	0.4275	2700
	0.4477	0.3998	2700		0.4576	0.4183	2700		0.4674	0.4367	2700
	0.4534	0.4011	2700		0.4636	0.4197	2700		0.4739	0.4382	2700
	0.4483	0.3919	2700		0.4585	0.4104	2700		0.4688	0.4290	2700
5W	0.4483	0.3919	2700	7W	0.4585	0.4104	2700	9W	0.4688	0.4290	2700
	0.4534	0.4011	2700		0.4636	0.4197	2700		0.4739	0.4382	2700
	0.4591	0.4025	2700		0.4697	0.4211	2700		0.4803	0.4398	2700
	0.4538	0.3931	2700		0.4644	0.4118	2700		0.4750	0.4304	2700
5X	0.4538	0.3931	2700	7X	0.4644	0.4118	2700	9X	0.4750	0.4304	2700
	0.4591	0.4025	2700		0.4697	0.4211	2700		0.4803	0.4398	2700
	0.4648	0.4038	2700		0.4758	0.4225	2700		0.4868	0.4413	2700
	0.4593	0.3944	2700		0.4703	0.4132	2700		0.4813	0.4319	2700

Group	Cx	Cy	CCT	Group	Cx	Cy	CCT	Group	Cx	Cy	CCT
4R	0.4109	0.3726	3000	6T	0.4342	0.3957	3000	9S	0.4387	0.4197	3000
	0.4147	0.3814	3000		0.4386	0.4048	3000		0.4428	0.4286	3000
	0.4222	0.3840	3000		0.4468	0.4077	3000		0.4519	0.4319	3000
	0.4181	0.3751	3000		0.4420	0.3985	3000		0.4474	0.4228	3000
4S	0.4181	0.3751	3000	7R	0.4223	0.3990	3000	9T	0.4474	0.4228	3000
	0.4222	0.3840	3000		0.4261	0.4077	3000		0.4519	0.4319	3000
	0.4298	0.3867	3000		0.4346	0.4108	3000		0.4609	0.4352	3000
	0.4254	0.3776	3000		0.4305	0.4019	3000		0.4562	0.4260	3000
4T	0.4254	0.3776	3000	7S	0.4305	0.4019	3000	4O	0.3863	0.3609	3500
	0.4298	0.3867	3000		0.4346	0.4108	3000		0.3890	0.3690	3500
	0.4373	0.3893	3000		0.4430	0.4138	3000		0.3975	0.3731	3500
	0.4326	0.3801	3000		0.4386	0.4048	3000		0.3945	0.3648	3500
5R	0.4147	0.3814	3000	7T	0.4386	0.4048	3000	4P	0.3945	0.3648	3500
	0.4185	0.3902	3000		0.4430	0.4138	3000		0.3975	0.3731	3500
	0.4263	0.3929	3000		0.4515	0.4168	3000		0.4061	0.3773	3500
	0.4222	0.3840	3000		0.4468	0.4077	3000		0.4027	0.3687	3500
5S	0.4222	0.3840	3000	8R	0.4261	0.4077	3000	4Q	0.4027	0.3687	3500
	0.4263	0.3929	3000		0.4299	0.4165	3000		0.4061	0.3773	3500
	0.4342	0.3957	3000		0.4387	0.4197	3000		0.4147	0.3814	3500
	0.4298	0.3867	3000		0.4346	0.4108	3000		0.4109	0.3726	3500
5T	0.4298	0.3867	3000	8S	0.4346	0.4108	3000	5O	0.3890	0.3690	3500
	0.4342	0.3957	3000		0.4387	0.4197	3000		0.3916	0.3772	3500
	0.4420	0.3985	3000		0.4474	0.4228	3000		0.4006	0.3815	3500
	0.4373	0.3893	3000		0.4430	0.4138	3000		0.3975	0.3731	3500
6R	0.4185	0.3902	3000	8T	0.4430	0.4138	3000	5P	0.3975	0.3731	3500
	0.4223	0.3990	3000		0.4474	0.4228	3000		0.4006	0.3815	3500
	0.4305	0.4019	3000		0.4562	0.4260	3000		0.4095	0.3858	3500
	0.4263	0.3929	3000		0.4515	0.4168	3000		0.4061	0.3773	3500
6S	0.4263	0.3929	3000	9R	0.4299	0.4165	3000	5Q	0.4061	0.3773	3500
	0.4305	0.4019	3000		0.4337	0.4253	3000		0.4095	0.3858	3500
	0.4386	0.4048	3000		0.4428	0.4286	3000		0.4185	0.3902	3500
	0.4342	0.3957	3000		0.4387	0.4197	3000		0.4147	0.3814	3500

Group	Cx	Cy	CCT	Group	Cx	Cy	CCT	Group	Cx	Cy	CCT
6O	0.3916	0.3772	3500	8Q	0.4164	0.4029	3500	5M	0.3746	0.3624	4000
	0.3943	0.3853	3500		0.4198	0.4115	3500		0.3773	0.3726	4000
	0.4036	0.3898	3500		0.4299	0.4165	3500		0.3853	0.3776	4000
	0.4006	0.3815	3500		0.4261	0.4077	3500		0.3822	0.3670	4000
6P	0.4006	0.3815	3500	9O	0.3997	0.4015	3500	5N	0.3822	0.3670	4000
	0.4036	0.3898	3500		0.4023	0.4097	3500		0.3853	0.3776	4000
	0.4130	0.3944	3500		0.4128	0.4148	3500		0.3934	0.3825	4000
	0.4095	0.3858	3500		0.4097	0.4065	3500		0.3898	0.3716	4000
6Q	0.4095	0.3858	3500	9P	0.4097	0.4065	3500	6L	0.3692	0.3677	4000
	0.4130	0.3944	3500		0.4128	0.4148	3500		0.3714	0.3775	4000
	0.4223	0.3990	3500		0.4232	0.4201	3500		0.3799	0.3828	4000
	0.4185	0.3902	3500		0.4198	0.4115	3500		0.3773	0.3726	4000
7O	0.3943	0.3853	3500	9Q	0.4198	0.4115	3500	6M	0.3773	0.3726	4000
	0.3970	0.3934	3500		0.4232	0.4201	3500		0.3799	0.3828	4000
	0.4067	0.3982	3500		0.4337	0.4253	3500		0.3885	0.3882	4000
	0.4036	0.3898	3500		0.4299	0.4165	3500		0.3853	0.3776	4000
7P	0.4036	0.3898	3500	4L	0.3648	0.3479	4000	6N	0.3853	0.3776	4000
	0.4067	0.3982	3500		0.3670	0.3578	4000		0.3885	0.3882	4000
	0.4164	0.4029	3500		0.3746	0.3624	4000		0.3970	0.3935	4000
	0.4130	0.3944	3500		0.3719	0.3522	4000		0.3934	0.3825	4000
7Q	0.4130	0.3944	3500	4M	0.3719	0.3522	4000	7L	0.3714	0.3775	4000
	0.4164	0.4029	3500		0.3746	0.3624	4000		0.3736	0.3874	4000
	0.4261	0.4077	3500		0.3822	0.3670	4000		0.3826	0.3931	4000
	0.4223	0.3990	3500		0.3791	0.3564	4000		0.3799	0.3828	4000
8O	0.3970	0.3934	3500	4N	0.3791	0.3564	4000	7M	0.3799	0.3828	4000
	0.3997	0.4015	3500		0.3822	0.3670	4000		0.3826	0.3931	4000
	0.4097	0.4065	3500		0.3898	0.3716	4000		0.3916	0.3987	4000
	0.4067	0.3982	3500		0.3862	0.3607	4000		0.3885	0.3882	4000
8P	0.4067	0.3982	3500	5L	0.3670	0.3578	4000	7N	0.3885	0.3882	4000
	0.4097	0.4065	3500		0.3692	0.3677	4000		0.3916	0.3987	4000
	0.4198	0.4115	3500		0.3773	0.3726	4000		0.4006	0.4044	4000
	0.4164	0.4029	3500		0.3746	0.3624	4000		0.3970	0.3935	4000

Group	Cx	Cy	CCT	Group	Cx	Cy	CCT	Group	Cx	Cy	CCT
8L	0.3736	0.3874	4000	6K	0.3608	0.3616	4500	5I	0.3441	0.3428	5000
	0.3758	0.3973	4000		0.3625	0.3711	4500		0.3448	0.3515	5000
	0.3853	0.4033	4000		0.3714	0.3775	4500		0.3527	0.3578	5000
	0.3826	0.3931	4000		0.3692	0.3677	4500		0.3515	0.3487	5000
8M	0.3826	0.3931	4000	7J	0.3536	0.3646	4500	6H	0.3369	0.3451	5000
	0.3853	0.4033	4000		0.3548	0.3736	4500		0.3373	0.3534	5000
	0.3947	0.4093	4000		0.3642	0.3805	4500		0.3456	0.3601	5000
	0.3916	0.3987	4000		0.3625	0.3711	4500		0.3448	0.3515	5000
8N	0.3916	0.3987	4000	7K	0.3625	0.3711	4500	6I	0.3448	0.3515	5000
	0.3947	0.4093	4000		0.3642	0.3805	4500		0.3456	0.3601	5000
	0.4042	0.4153	4000		0.3736	0.3874	4500		0.3539	0.3669	5000
	0.4006	0.4044	4000		0.3714	0.3775	4500		0.3527	0.3578	5000
4J	0.3500	0.3375	4500	8J	0.3548	0.3736	4500	7H	0.3373	0.3534	5000
	0.3512	0.3465	4500		0.3560	0.3826	4500		0.3376	0.3616	5000
	0.3591	0.3522	4500		0.3659	0.3900	4500		0.3464	0.3688	5000
	0.3574	0.3427	4500		0.3642	0.3805	4500		0.3456	0.3601	5000
4K	0.3574	0.3427	4500	8K	0.3642	0.3805	4500	7I	0.3456	0.3601	5000
	0.3591	0.3522	4500		0.3659	0.3900	4500		0.3464	0.3688	5000
	0.3670	0.3578	4500		0.3758	0.3973	4500		0.3551	0.3760	5000
	0.3648	0.3479	4500		0.3736	0.3874	4500		0.3539	0.3669	5000
5J	0.3512	0.3465	4500	4H	0.3363	0.3287	5000	8H	0.3376	0.3616	5000
	0.3524	0.3555	4500		0.3366	0.3369	5000		0.3379	0.3698	5000
	0.3608	0.3616	4500		0.3441	0.3428	5000		0.3471	0.3775	5000
	0.3591	0.3522	4500		0.3433	0.3341	5000		0.3464	0.3688	5000
5K	0.3591	0.3522	4500	4I	0.3433	0.3341	5000	8I	0.3464	0.3688	5000
	0.3608	0.3616	4500		0.3441	0.3428	5000		0.3471	0.3775	5000
	0.3692	0.3677	4500		0.3515	0.3487	5000		0.3563	0.3851	5000
	0.3670	0.3578	4500		0.3503	0.3396	5000		0.3551	0.3760	5000
6J	0.3524	0.3555	4500	5H	0.3366	0.3369	5000	4F	0.3228	0.3170	5700
	0.3536	0.3646	4500		0.3369	0.3451	5000		0.3222	0.3243	5700
	0.3625	0.3711	4500		0.3448	0.3515	5000		0.3294	0.3306	5700
	0.3608	0.3616	4500		0.3441	0.3428	5000		0.3295	0.3228	5700

Group	Cx	Cy	CCT	Group	Cx	Cy	CCT	Group	Cx	Cy	CCT
4G	0.3295	0.3228	5700	7G	0.3292	0.3461	5700	5C	0.3068	0.3113	6500
	0.3294	0.3306	5700		0.3292	0.3539	5700		0.3055	0.3177	6500
	0.3366	0.3369	5700		0.3376	0.3616	5700		0.3108	0.3229	6500
	0.3363	0.3287	5700		0.3373	0.3534	5700		0.3119	0.3162	6500
5F	0.3222	0.3243	5700	8F	0.3206	0.3462	5700	5D	0.3119	0.3162	6500
	0.3217	0.3316	5700		0.3201	0.3534	5700		0.3108	0.3229	6500
	0.3293	0.3384	5700		0.3291	0.3617	5700		0.3162	0.3282	6500
	0.3294	0.3306	5700		0.3292	0.3539	5700		0.3170	0.3212	6500
5G	0.3294	0.3306	5700	8G	0.3292	0.3539	5700	5E	0.3170	0.3212	6500
	0.3293	0.3384	5700		0.3291	0.3617	5700		0.3162	0.3282	6500
	0.3369	0.3451	5700		0.3379	0.3698	5700		0.3216	0.3334	6500
	0.3366	0.3369	5700		0.3376	0.3616	5700		0.3221	0.3262	6500
6F	0.3217	0.3316	5700	4C	0.3081	0.3049	6500	6C	0.3055	0.3177	6500
	0.3212	0.3389	5700		0.3068	0.3113	6500		0.3041	0.3240	6500
	0.3292	0.3461	5700		0.3119	0.3162	6500		0.3098	0.3296	6500
	0.3293	0.3384	5700		0.3130	0.3095	6500		0.3108	0.3229	6500
6G	0.3293	0.3384	5700	4D	0.3130	0.3095	6500	6D	0.3108	0.3229	6500
	0.3292	0.3461	5700		0.3119	0.3162	6500		0.3098	0.3296	6500
	0.3373	0.3534	5700		0.3170	0.3212	6500		0.3154	0.3352	6500
	0.3369	0.3451	5700		0.3178	0.3142	6500		0.3162	0.3282	6500
7F	0.3212	0.3389	5700	4E	0.3178	0.3142	6500	6E	0.3162	0.3282	6500
	0.3206	0.3462	5700		0.3170	0.3212	6500		0.3154	0.3352	6500
	0.3292	0.3539	5700		0.3221	0.3262	6500		0.3210	0.3408	6500
	0.3292	0.3461	5700		0.3226	0.3189	6500		0.3216	0.3334	6500

Group Name on Label

Example: BX-4C-46

Brightness

Color Chromaticity

Forward Voltage

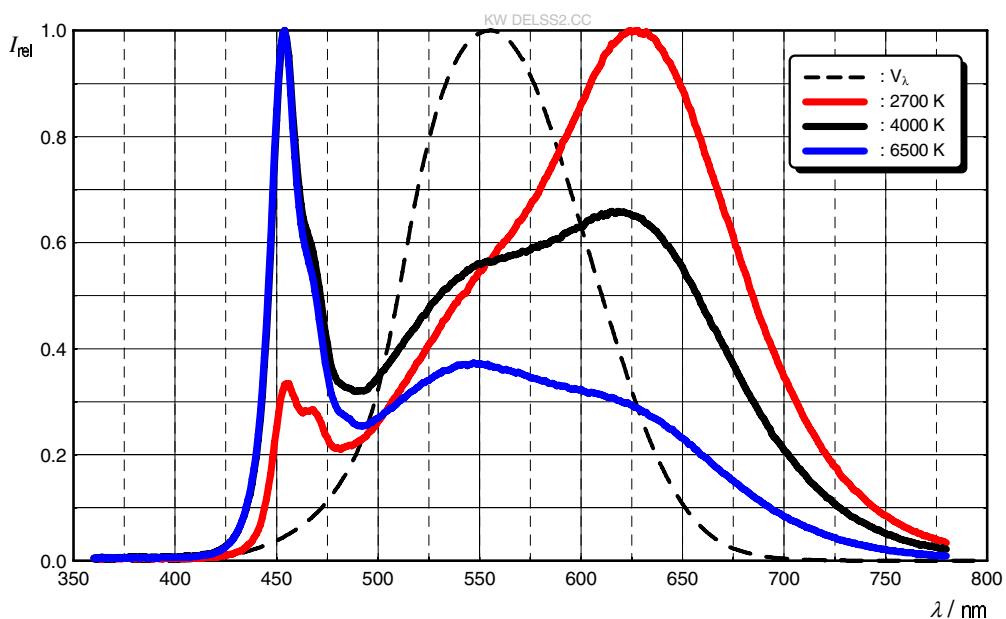
BX

4C

46

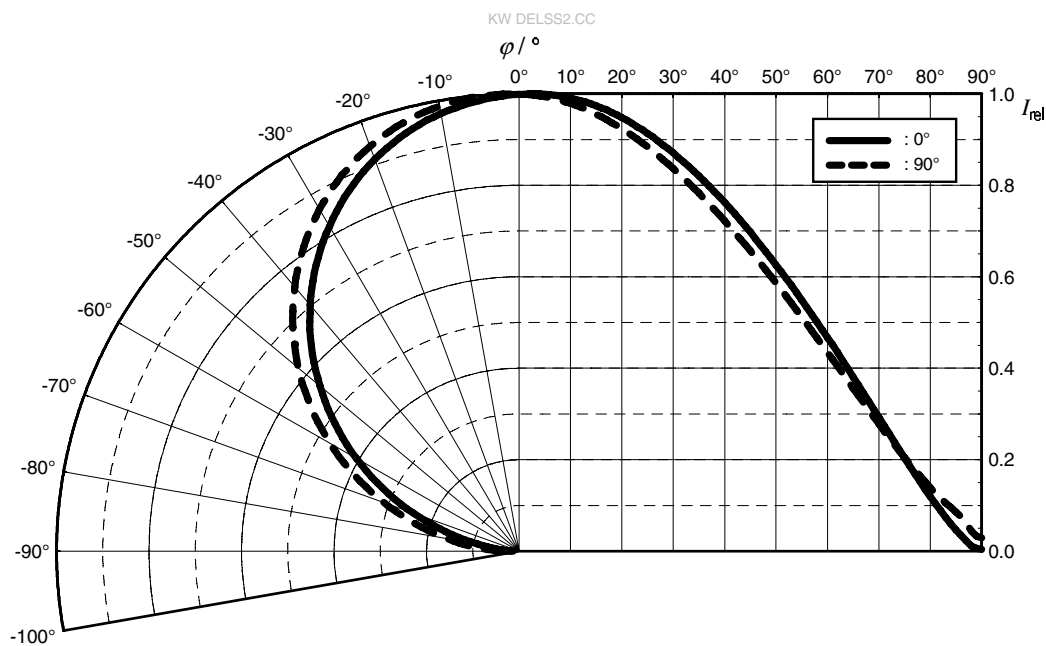
Relative Spectral Emission ⁶⁾

$I_{rel} = f(\lambda); I_F = 30 \text{ mA}; T_S = 25 \text{ }^\circ\text{C}$



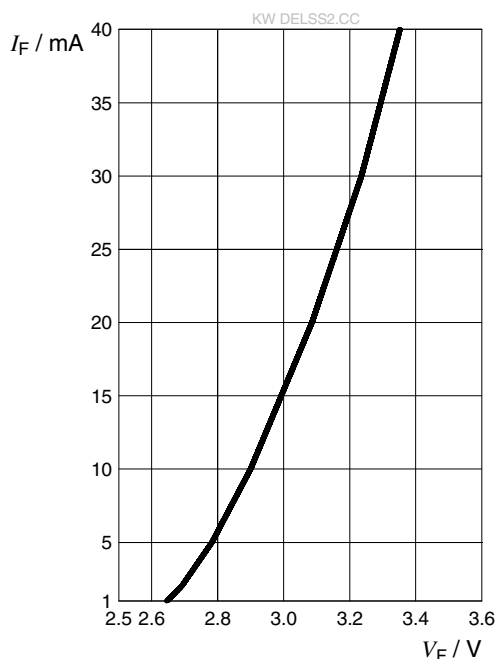
Radiation Characteristics ⁶⁾

$I_{rel} = f(\phi); T_S = 25 \text{ }^\circ\text{C}$



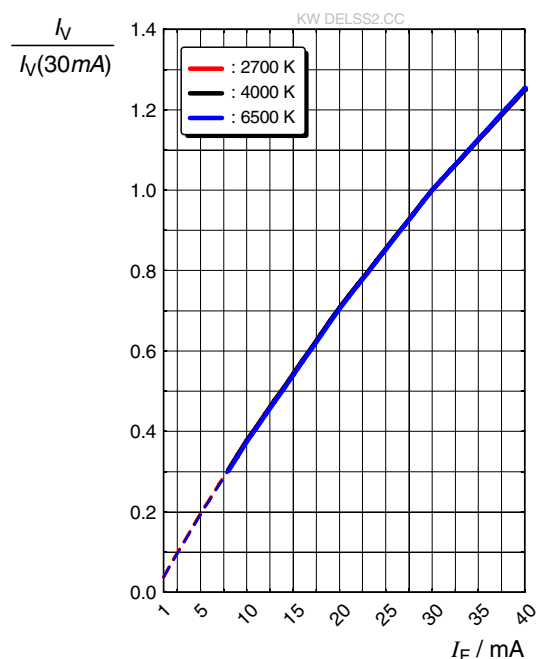
Forward current ⁶⁾

$$I_F = f(V_F); T_S = 25\text{ °C}$$



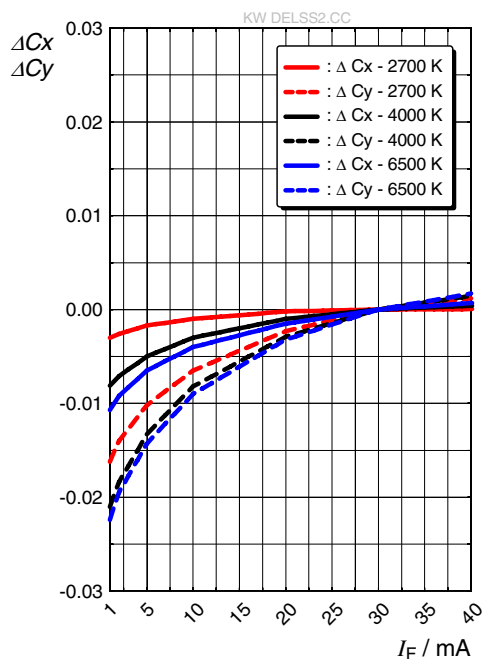
Relative Luminous Intensity ^{6), 7)}

$$I_V/I_V(30\text{ mA}) = f(I_F); T_S = 25\text{ °C}$$



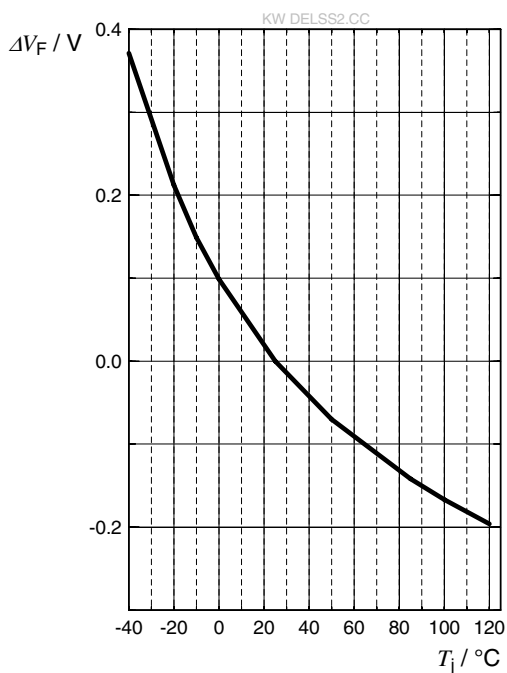
Chromaticity Coordinate Shift ⁶⁾

$$\Delta C_x, \Delta C_y = f(I_F); T_S = 25\text{ °C}$$



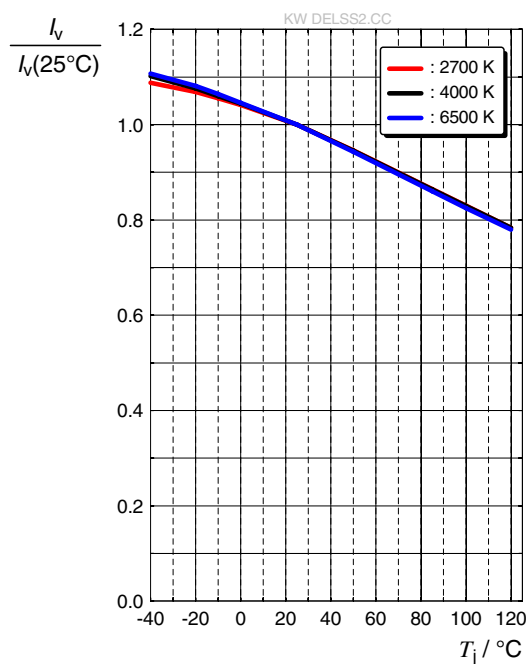
Forward Voltage ⁶⁾

$$\Delta V_F = V_F - V_F(25^\circ\text{C}) = f(T_j); I_F = 30\text{ mA}$$



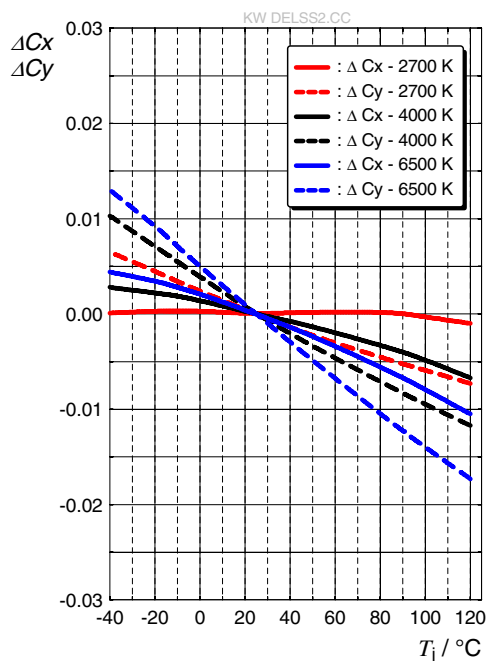
Relative Luminous Intensity ⁶⁾

$$I_V / I_V(25^\circ\text{C}) = f(T_j); I_F = 30\text{ mA}$$



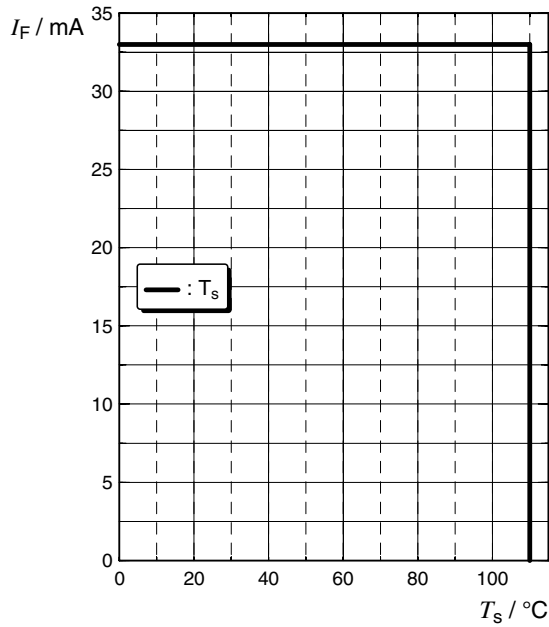
Chromaticity Coordinate Shift ⁶⁾

$$\Delta Cx, \Delta Cy = f(T_j); I_F = 30\text{ mA}$$



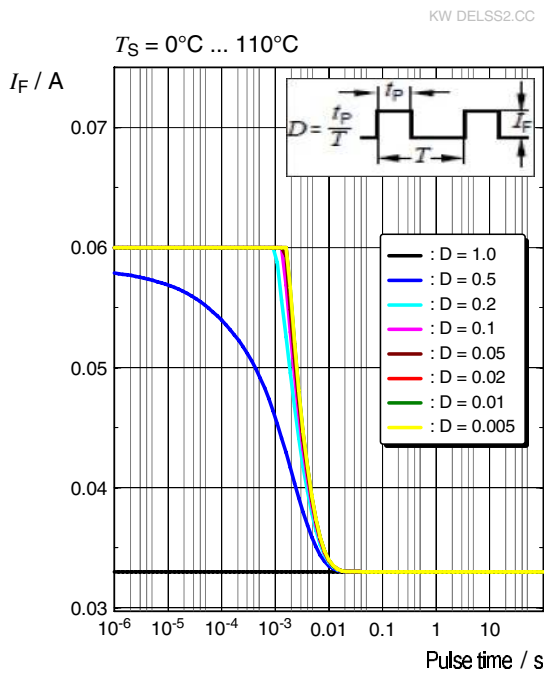
Max. Permissible Forward Current

$$I_F = f(T)$$

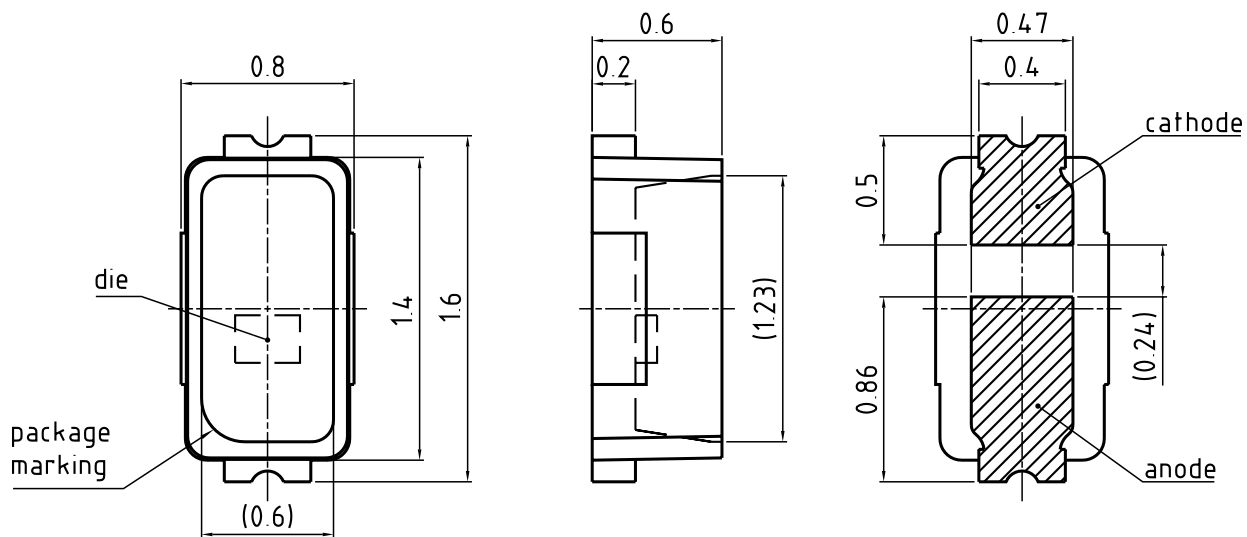


Permissible Pulse Handling Capability

$$I_F = f(t_p); D: \text{Duty cycle}$$



Dimensional Drawing ⁸⁾



general tolerance ± 0.1
lead finish Ag 

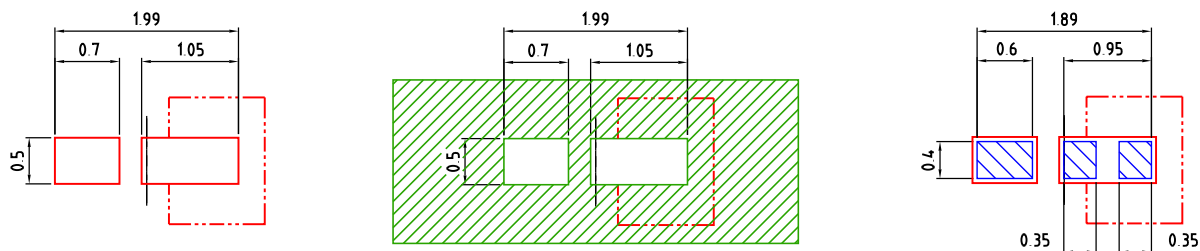
C63062-A4275-A1.-02

Further Information:

Approximate Weight: 2.0 mg

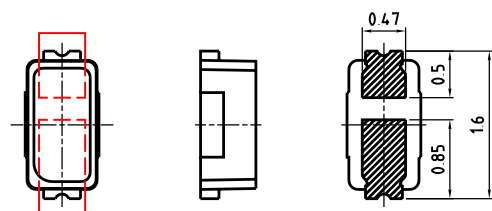
Package marking: Anode

Recommended Solder Pad ⁸⁾



The usage of solder resist between anode and cathode pads is mandatory for applications where water may condense

Component Location on Pad

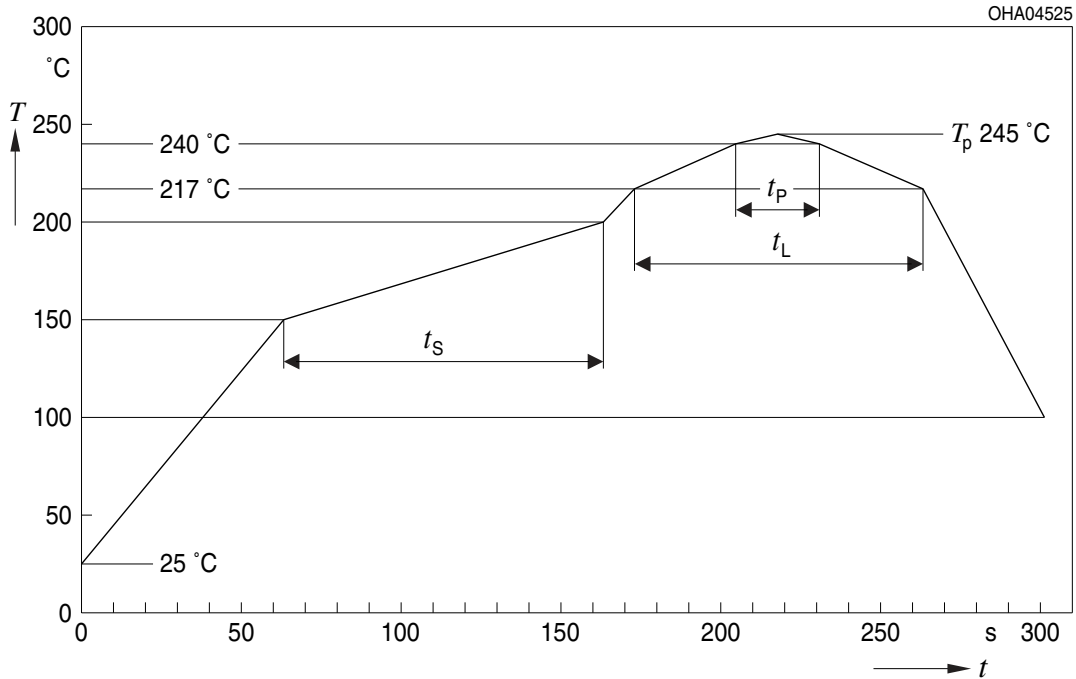


E062.3010.187 -02

All products are packed in a dry pack bag (Moisture Barrier Bag, MBB) according MIL-PRF-81705, after opening the MBB the products should go to reflow soldering process. Unused remaining LEDs should be protected from environment due to silver plated soldering terminal. In order to maintain solderability it is recommended to protect the silver plated solder terminals from corrosive environment before soldering. For superior solder joint connectivity results we recommend soldering under standard nitrogen atmosphere.

Reflow Soldering Profile

Product complies to MSL Level 2 acc. to JEDEC J-STD-020E

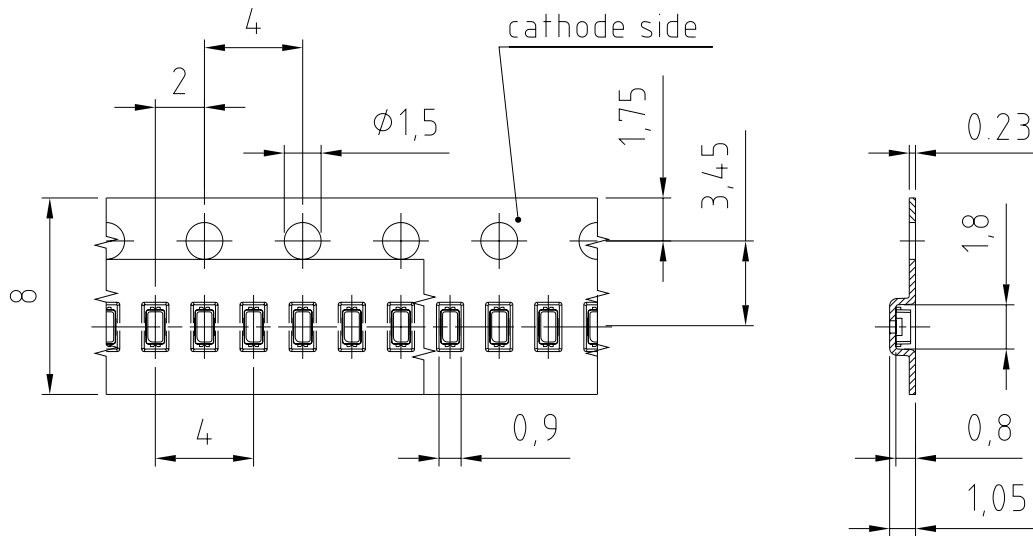


Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Minimum	Recommendation	Maximum	
Ramp-up rate to preheat ^{*)} 25 °C to 150 °C			2	3	K/s
Time t_s T_{Smin} to T_{Smax}	t_s	60	100	120	s
Ramp-up rate to peak ^{*)} T_{Smax} to T_p			2	3	K/s
Liquidus temperature	T_L		217		°C
Time above liquidus temperature	t_L		80	100	s
Peak temperature	T_p		245	260	°C
Time within 5 °C of the specified peak temperature $T_p - 5$ K	t_p	10	20	30	s
Ramp-down rate* T_p to 100 °C			3	6	K/s
Time 25 °C to T_p				480	s

All temperatures refer to the center of the package, measured on the top of the component

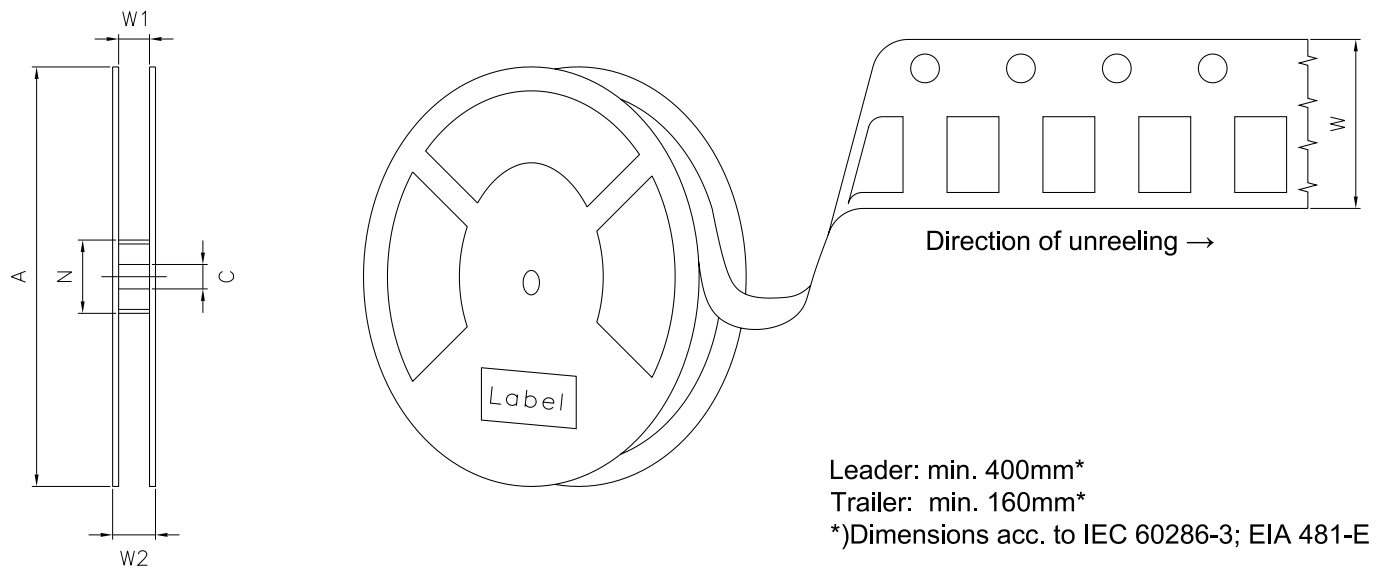
* slope calculation DT/Dt : Dt max. 5 s; fulfillment for the whole T-range

Taping ⁸⁾



C63062-A4275-B5 -02

Tape and Reel ⁹⁾



Reel Dimensions

A	W	N_{min}	W_1	W_{2max}	Pieces per PU
180 mm	$8 + 0.3 / - 0.1$ mm	60 mm	$8.4 + 2$ mm	14.4 mm	2000

Barcode-Product-Label (BPL)

OSRAM Opto Semiconductors LX XXXX BIN1: XX-XX-X-XXX-X

RoHS Compliant

(6P) BATCH NO: 1234567890

(1T) LOT NO: 1234567890 (9D) D/C: 1234

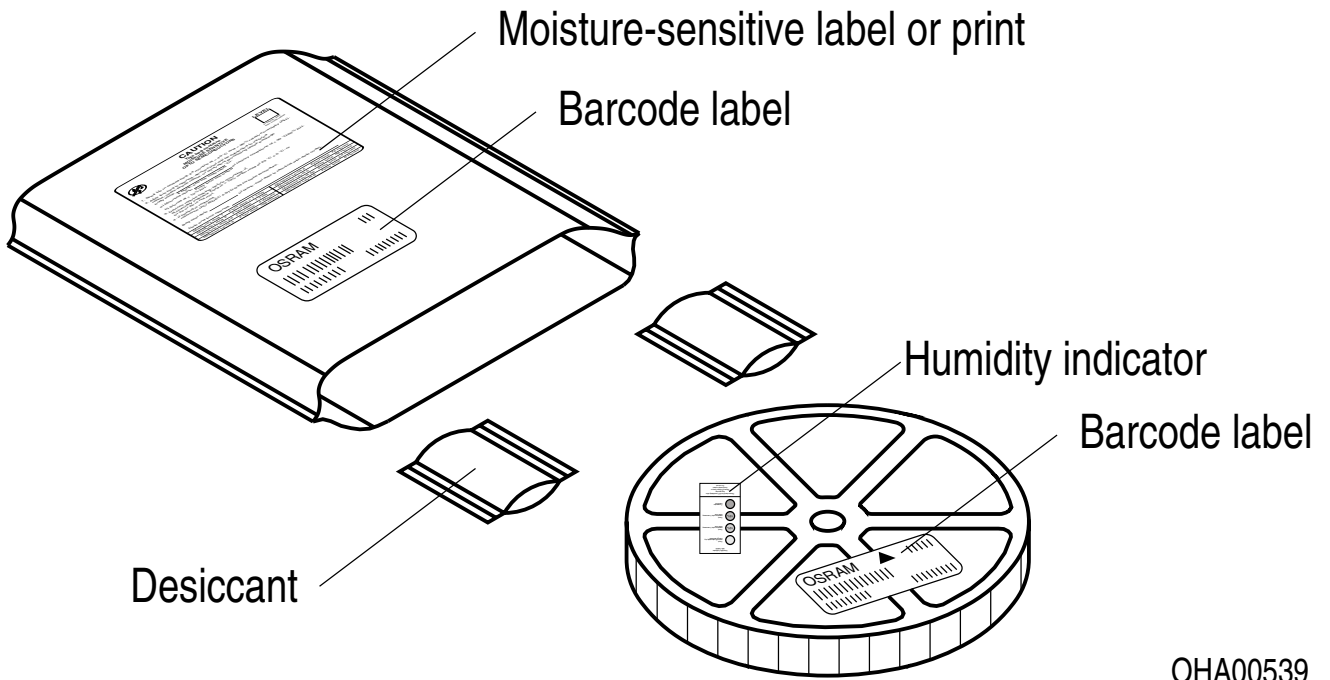
(X) PROD NO: 123456789 (Q) QTY: 9999 (G) GROUP: XX-XX-X-X

ML Temp ST
X XXX °C X

Pack: RXX
DEMY XXX
X_X123_1234.1234 X

OHA04563

Dry Packing Process and Materials ⁸⁾



OHA00539

Moisture-sensitive product is packed in a dry bag containing desiccant and a humidity card according JEDEC-STD-033.

Notes

The evaluation of eye safety occurs according to the standard IEC 62471:2006 (photo biological safety of lamps and lamp systems). Within the risk grouping system of this IEC standard, the device specified in this data sheet fall into the class **exempt group (exposure time 10000 s)**. Under real circumstances (for exposure time, conditions of the eye pupils, observation distance), it is assumed that no endangerment to the eye exists from these devices. As a matter of principle, however, it should be mentioned that intense light sources have a high secondary exposure potential due to their blinding effect. When looking at bright light sources (e.g. headlights), temporary reduction in visual acuity and afterimages can occur, leading to irritation, annoyance, visual impairment, and even accidents, depending on the situation.

Subcomponents of this device contain, in addition to other substances, metal filled materials including silver. Metal filled materials can be affected by environments that contain traces of aggressive substances. Therefore, we recommend that customers minimize device exposure to aggressive substances during storage, production, and use. Devices that showed visible discoloration when tested using the described tests above did show no performance deviations within failure limits during the stated test duration. Respective failure limits are described in the IEC60810.

For further application related information please visit www.osram-os.com/appnotes

Disclaimer

Attention please!

The information describes the type of component and shall not be considered as assured characteristics. Terms of delivery and rights to change design reserved. Due to technical requirements components may contain dangerous substances.

For information on the types in question please contact our Sales Organization.

If printed or downloaded, please find the latest version on our website.

Packing

Please use the recycling operators known to you. We can also help you – get in touch with your nearest sales office. By agreement we will take packing material back, if it is sorted. You must bear the costs of transport. For packing material that is returned to us unsorted or which we are not obliged to accept, we shall have to invoice you for any costs incurred.

Product and functional safety devices/applications or medical devices/applications

Our components are not developed, constructed or tested for the application as safety relevant component or for the application in medical devices.

Our products are not qualified at module and system level for such application.

In case buyer – or customer supplied by buyer – considers using our components in product safety devices/ applications or medical devices/applications, buyer and/or customer has to inform our local sales partner immediately and we and buyer and /or customer will analyze and coordinate the customer-specific request between us and buyer and/or customer.

Glossary

- 1) **Brightness:** Brightness values are measured during a current pulse of typically 25 ms, with an internal reproducibility of $\pm 8\%$ and an expanded uncertainty of $\pm 11\%$ (acc. to GUM with a coverage factor of $k = 3$).
- 2) **Reverse Operation:** This product is intended to be operated applying a forward current within the specified range. Applying any continuous reverse bias or forward bias below the voltage range of light emission shall be avoided because it may cause migration which can change the electro-optical characteristics or damage the LED.
- 3) **Chromaticity coordinate groups:** Chromaticity coordinates are measured during a current pulse of typically 25 ms, with an internal reproducibility of ± 0.005 and an expanded uncertainty of ± 0.01 (acc. to GUM with a coverage factor of $k = 3$).
- 4) **Forward Voltage:** The forward voltage is measured during a current pulse of typically 8 ms, with an internal reproducibility of ± 0.05 V and an expanded uncertainty of ± 0.1 V (acc. to GUM with a coverage factor of $k = 3$).
- 5) **Thermal Resistance:** $R_{th\ max}$ is based on statistic values (6σ).
- 6) **Typical Values:** Due to the special conditions of the manufacturing processes of semiconductor devices, the typical data or calculated correlations of technical parameters can only reflect statistical figures. These do not necessarily correspond to the actual parameters of each single product, which could differ from the typical data and calculated correlations or the typical characteristic line. If requested, e.g. because of technical improvements, these typ. data will be changed without any further notice.
- 7) **Characteristic curve:** In the range where the line of the graph is broken, you must expect higher differences between single devices within one packing unit.
- 8) **Tolerance of Measure:** Unless otherwise noted in drawing, tolerances are specified with ± 0.1 and dimensions are specified in mm.
- 9) **Tape and Reel:** All dimensions and tolerances are specified acc. IEC 60286-3 and specified in mm.

Revision History

Version	Date	Change
1.0	2020-11-26	Initial Version
1.1	2022-07-28	New Layout Applications Description



EU RoHS and China RoHS compliant product

此产品符合欧盟 RoHS 指令的要求；
按照中国的相关法规和标准，
不含有毒有害物质或元素。

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