DOMINANT™
Opto Technologies
Innovating Illumination

DATA SHEET :

PrimaxPlus

InGaN: MAF-EHJ

Primax

Synonymous with function and performance, enter the Primax, the new era of high intensity illumination in LED. With its high flux output and high luminous intensity, Primax transcends today LED lightings technology and how we perceive it. The small package outline (3.7 x 3.5 x 0.8 mm) and high intensity make it an ideal choice for backlighting, signage, exterior automotive lighting and decorative lighting.

Features:

- Super high brightness surface mount LED
- 120° viewing angle.
- Compact package outline (LxW) of 3.7 x 3.5 mm.
- Ultra low height profile - 0.8mm.
- Low thermal resistance.
- Compatible to IR reflow soldering.
- Environmental friendly; RoHS compliance.
- Superior corrosion resistance.
- Compliance to automotive standard; AEC-Q102.

Applications:

- Automotive Interior Lighting: eg: Dome Lamp, Map Lighting, Trunk Lighting.
- Industrial Illumination.
- White Goods Lighting.

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Optical Characteristics at Tj=25°C

Part Number	Color	Viewing Angle°	Luminous Flux @ 150mA (lm) Appx. 1.2		
			Min.	Typ.	Max.
● MAF-EHJ-Q3R-5J8Q	Warm White	120	34.80	45.20	51.70
● MAF-EHJ-QR2-5R8X	Warm White	120	30.60	39.80	45.20

● Not for new design

Notes:
1. High color rendering index (CRI). Minimum CRI of 90.

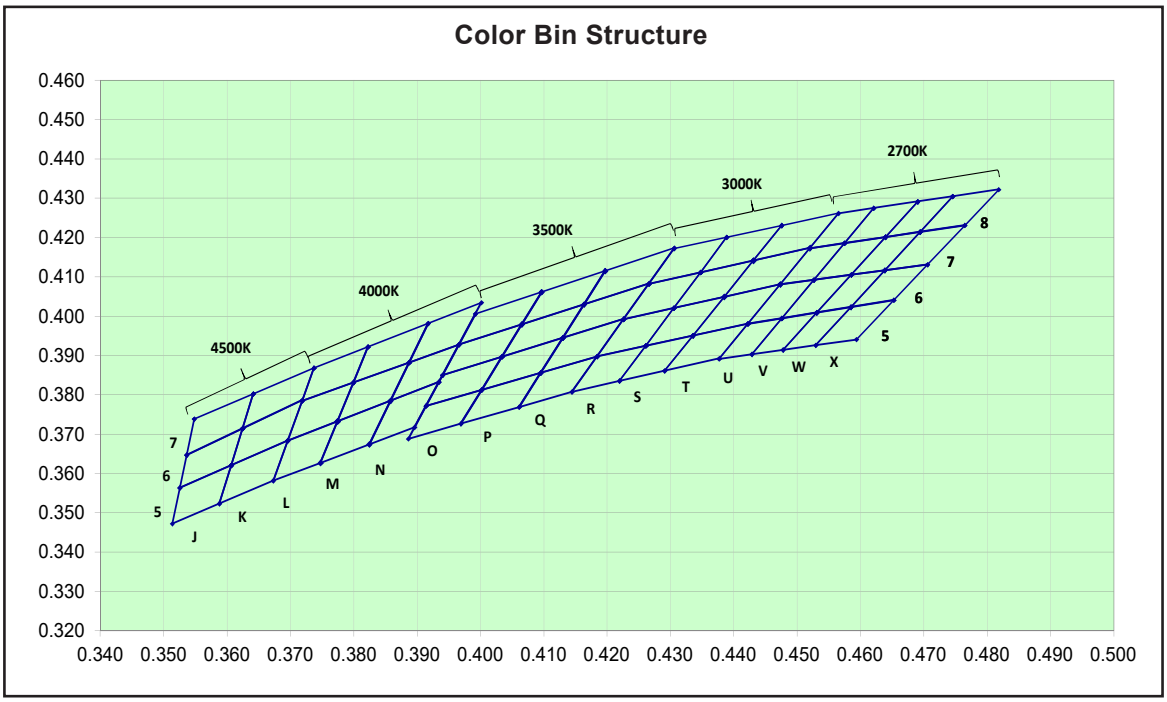
Electrical Characteristics at Tj=25°C

Part Number	Vf @ If = 150 mA Appx. 3.1			V_r @ I_r = 10uA Appx. 6.1
	Min. (V)	Typ. (V)	Max. (V)	Min. (V)
MAF-EHJ	2.80	3.10	3.40	5

Absolute Maximum Ratings

	Maximum Value	Unit
DC forward current	250	mA
Peak pulse current (tp<=100µs, Duty cycle=0.03, 55°C)	500	mA
Reverse voltage Appx. 6.1	5	V
ESD threshold (HBM)	2	kV
LED junction temperature	150	˚C
Operating temperature	-40 … +125	˚C
Storage temperature	-40 … +125	˚C
Thermal resistance (Rated current = 150mA, Ts = 25 ˚C) - Real Thermal Resistance Junction / solder point, $R_{th\ JS\ real}$ (typ = 25) - Electrical Thermal Resistance Junction / solder point, $R_{th\ JS\ el}$ (typ = 18)	 30 21	 K/W K/W

MAF-EHJ, Color Grouping *Appx. 2.1*



Bin		1	2	3	4
5U	Cx	0.4422	0.4476	0.4428	0.4377
	Cy	0.3981	0.3995	0.3903	0.3891
6U	Cx	0.4473	0.4526	0.4476	0.4422
	Cy	0.4081	0.4092	0.3995	0.3981
7U	Cx	0.4520	0.4574	0.4526	0.4473
	Cy	0.4172	0.4185	0.4092	0.4081
8U	Cx	0.4565	0.4621	0.4574	0.4520
	Cy	0.4261	0.4275	0.4185	0.4172
5V	Cx	0.4476	0.4531	0.4478	0.4428
	Cy	0.3995	0.4009	0.3914	0.3903
6V	Cx	0.4526	0.4585	0.4531	0.4476
	Cy	0.4092	0.4105	0.4009	0.3995
7V	Cx	0.4574	0.4639	0.4585	0.4526
	Cy	0.4185	0.4201	0.4105	0.4092
8V	Cx	0.4621	0.4690	0.4639	0.4574
	Cy	0.4275	0.4291	0.4201	0.4185
5W	Cx	0.4531	0.4585	0.4529	0.4478
	Cy	0.4009	0.4023	0.3926	0.3914
6W	Cx	0.4585	0.4638	0.4585	0.4531
	Cy	0.4105	0.4117	0.4023	0.4009
7W	Cx	0.4639	0.4694	0.4638	0.4585
	Cy	0.4201	0.4214	0.4117	0.4105
8W	Cx	0.4690	0.4745	0.4694	0.4639
	Cy	0.4291	0.4305	0.4214	0.4201
5X	Cx	0.4585	0.4652	0.4593	0.4529
	Cy	0.4023	0.4041	0.3941	0.3926
6X	Cx	0.4638	0.4706	0.4652	0.4585
	Cy	0.4117	0.4131	0.4041	0.4023

Bin		1	2	3	4
7X	Cx	0.4694	0.4765	0.4706	0.4638
	Cy	0.4214	0.4231	0.4131	0.4117
8X	Cx	0.4745	0.4818	0.4765	0.4694
	Cy	0.4305	0.4322	0.4231	0.4214
5R	Cx	0.4184	0.4261	0.4219	0.4145
	Cy	0.3898	0.3925	0.3835	0.3808
6R	Cx	0.4226	0.4305	0.4261	0.4184
	Cy	0.3992	0.4021	0.3925	0.3898
7R	Cx	0.4266	0.4347	0.4305	0.4226
	Cy	0.4082	0.4111	0.4021	0.3992
8R	Cx	0.4305	0.4389	0.4347	0.4266
	Cy	0.4172	0.4201	0.4111	0.4082
5S	Cx	0.4261	0.4335	0.4291	0.4219
	Cy	0.3925	0.3951	0.3861	0.3835
6S	Cx	0.4305	0.4385	0.4335	0.4261
	Cy	0.4021	0.4049	0.3951	0.3925
7S	Cx	0.4347	0.4431	0.4385	0.4305
	Cy	0.4111	0.4141	0.4049	0.4021
8S	Cx	0.4389	0.4475	0.4431	0.4347
	Cy	0.4201	0.4231	0.4141	0.4111
5T	Cx	0.4335	0.4422	0.4377	0.4291
	Cy	0.3951	0.3981	0.3893	0.3861
6T	Cx	0.4385	0.4473	0.4422	0.4335
	Cy	0.4049	0.4081	0.3981	0.3951
7T	Cx	0.4431	0.4520	0.4473	0.4385
	Cy	0.4141	0.4174	0.4081	0.4049
8T	Cx	0.4475	0.4565	0.4520	0.4431
	Cy	0.4231	0.4262	0.4174	0.4141
5O	Cx	0.3914	0.4002	0.3969	0.3886
	Cy	0.3772	0.3813	0.3726	0.3688
6O	Cx	0.3940	0.4034	0.4002	0.3914
	Cy	0.3850	0.3897	0.3813	0.3772
7O	Cx	0.3966	0.4065	0.4034	0.3940
	Cy	0.3928	0.3979	0.3897	0.3850
8O	Cx	0.3992	0.4096	0.4065	0.3966
	Cy	0.4006	0.4061	0.3979	0.3928
5P	Cx	0.4002	0.4095	0.4061	0.3969
	Cy	0.3813	0.3856	0.3769	0.3726
6P	Cx	0.4034	0.4130	0.4095	0.4002
	Cy	0.3897	0.3945	0.3856	0.3813
7P	Cx	0.4065	0.4163	0.4130	0.4034
	Cy	0.3979	0.4030	0.3945	0.3897
8P	Cx	0.4096	0.4197	0.4163	0.4065
	Cy	0.4061	0.4115	0.4030	0.3979

Bin		1	2	3	4
5Q	Cx	0.4095	0.4184	0.4144	0.4061
	Cy	0.3856	0.3897	0.3807	0.3769
6Q	Cx	0.4130	0.4226	0.4184	0.4095
	Cy	0.3945	0.3993	0.3897	0.3856
7Q	Cx	0.4163	0.4266	0.4226	0.4130
	Cy	0.4030	0.4083	0.3993	0.3945
8Q	Cx	0.4197	0.4306	0.4266	0.4163
	Cy	0.4115	0.4173	0.4083	0.4030
5L	Cx	0.3696	0.3774	0.3747	0.3673
	Cy	0.3684	0.3733	0.3627	0.3582
6L	Cx	0.3718	0.3799	0.3774	0.3696
	Cy	0.3785	0.3832	0.3733	0.3684
7L	Cx	0.3737	0.3822	0.3799	0.3718
	Cy	0.3868	0.3922	0.3832	0.3785
5M	Cx	0.3774	0.3858	0.3824	0.3747
	Cy	0.3733	0.3785	0.3674	0.3627
6M	Cx	0.3799	0.3887	0.3858	0.3774
	Cy	0.3832	0.3882	0.3785	0.3733
7M	Cx	0.3822	0.3917	0.3887	0.3799
	Cy	0.3922	0.3982	0.3882	0.3832
5N	Cx	0.3858	0.3934	0.3896	0.3824
	Cy	0.3785	0.3833	0.3717	0.3674
6N	Cx	0.3887	0.3966	0.3934	0.3858
	Cy	0.3882	0.3928	0.3833	0.3785
7N	Cx	0.3917	0.4002	0.3966	0.3887
	Cy	0.3982	0.4035	0.3928	0.3882
5J	Cx	0.3525	0.3607	0.3588	0.3513
	Cy	0.3564	0.3621	0.3524	0.3472
6J	Cx	0.3536	0.3624	0.3607	0.3525
	Cy	0.3647	0.3715	0.3621	0.3564
7J	Cx	0.3548	0.3641	0.3624	0.3536
	Cy	0.3739	0.3803	0.3715	0.3647
5K	Cx	0.3607	0.3696	0.3673	0.3588
	Cy	0.3621	0.3684	0.3582	0.3524
6K	Cx	0.3624	0.3719	0.3696	0.3607
	Cy	0.3715	0.3787	0.3684	0.3621
7K	Cx	0.3641	0.3737	0.3719	0.3624
	Cy	0.3803	0.3868	0.3787	0.3715

Luminous Flux Group at Tj=25^{0}C

Brightness Group	Luminous Flux (lm) *Appx. 1.2*
Q2	30.6 ... 34.8
Q3	34.8 ... 39.8
R2	39.8 ... 45.2
R3	45.2 ... 51.7

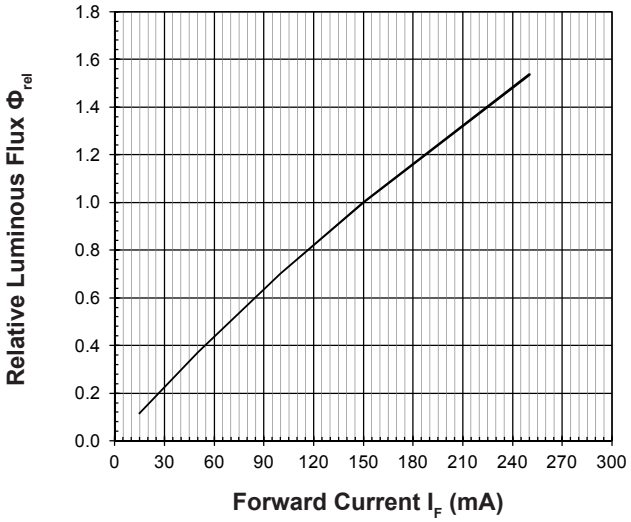
Vf Binning (Optional)

Vf Bin @ 150mA	Forward Voltage (V) *Appx. 3.1*
VR7	2.80 ... 3.10
VR8	3.10 ... 3.40

Please consult sales and marketing for special part number to incorporate Vf binning.

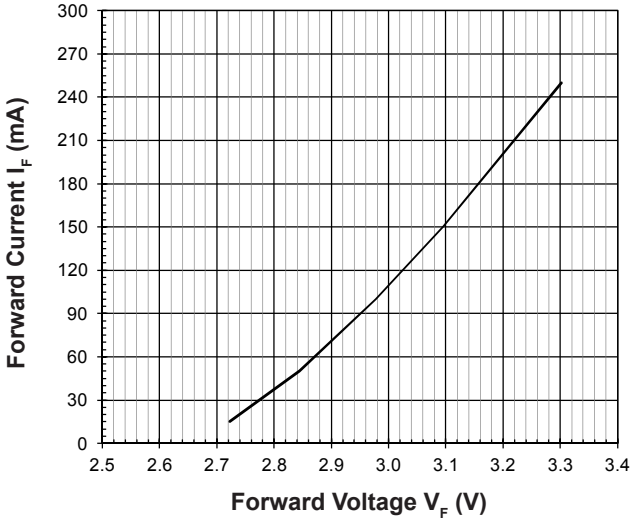
Relative Luminous Flux Vs Forward Current

$\Phi_V/\Phi_V(150mA) = f(I_F)$; $T_j = 25°C$



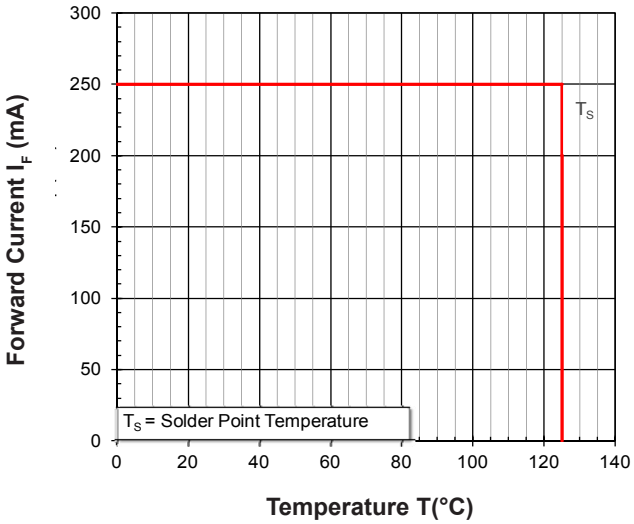
Forward Current Vs Forward Voltage

$I_F = f(V_F)$; $T_j = 25°C$



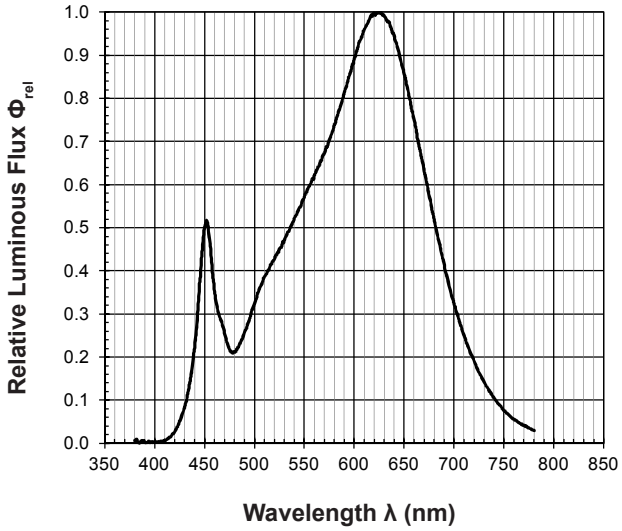
Maximum Current Vs Temperature

$I_F=f(T)$



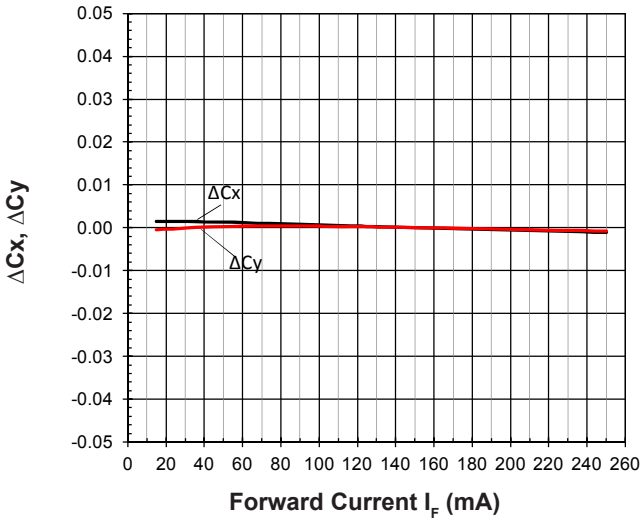
Relative Spectral Emission

$\Phi_{rel} = f(\lambda)$; $T_j = 25°C$; $I_F = 150mA$



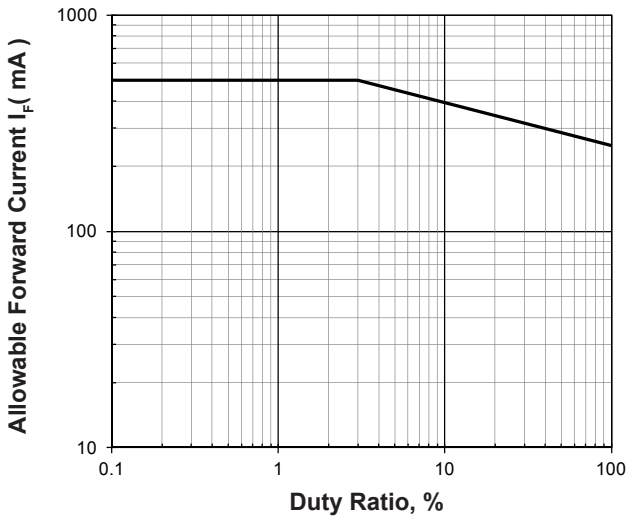
Chromaticity Coordinate Shift Vs Forward Current

$\Delta Cx, \Delta Cy = f(I_F); T_j = 25°C$

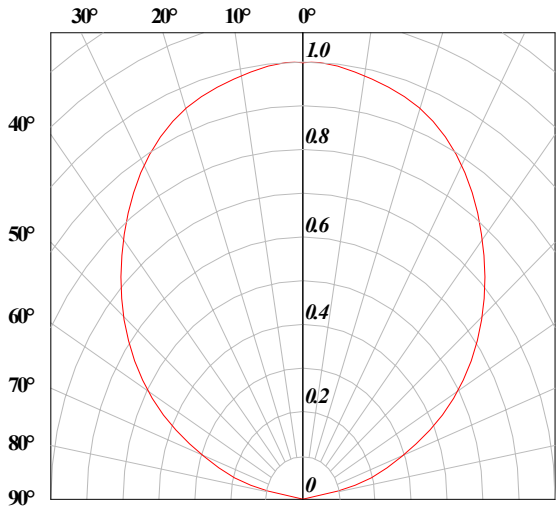


Allowable Forward Current Vs Duty Ratio

($T_S = 55°C$; $t_p \leq 100\mu s$)

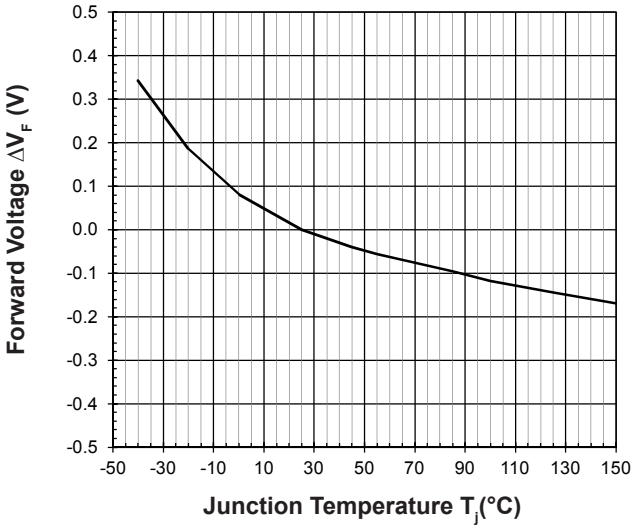


Radiation Pattern



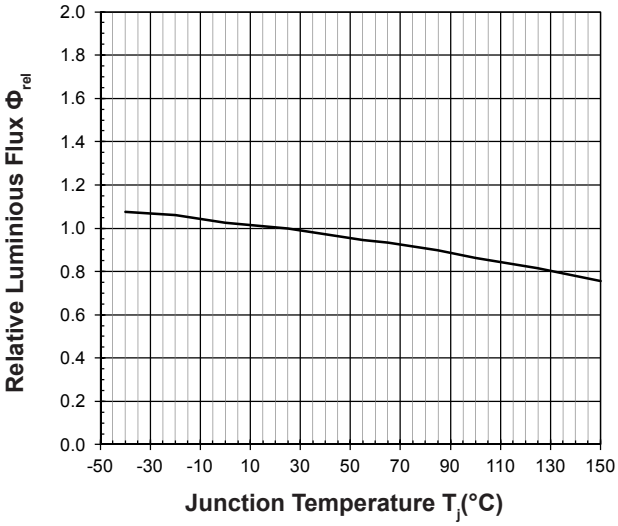
Forward Voltage Vs Junction Temperature

$\Delta V_F = V_F - V_F(25°C) = f(T_j)$; I_F =150mA



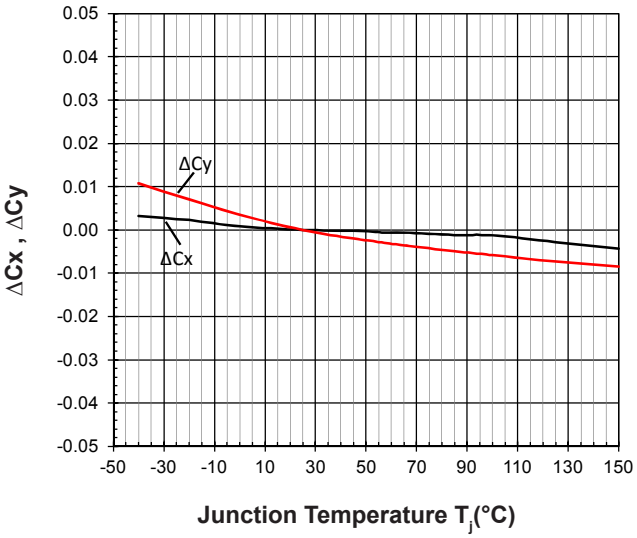
Relative Luminious Flux Vs Junction Temperature

$\Phi V/\Phi V(25°C) = f(T_j)$; I_F = 150mA

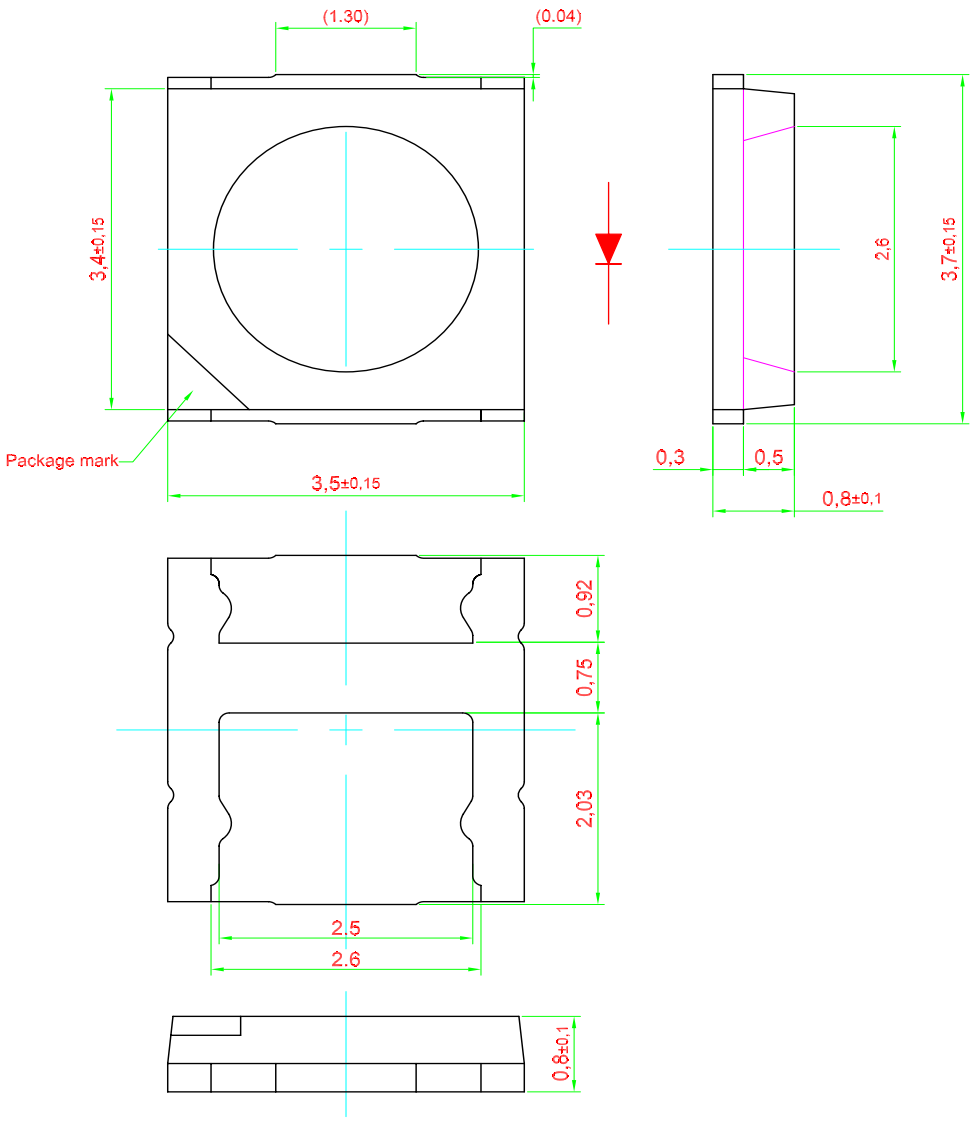


Chromaticity Coordinate Shift Vs Junction Temperature

$\Delta Cx, \Delta Cy = f(T_j)$; I_F = 150mA



PrimaxPlus • InGaN : MAF-EHJ Package Outlines

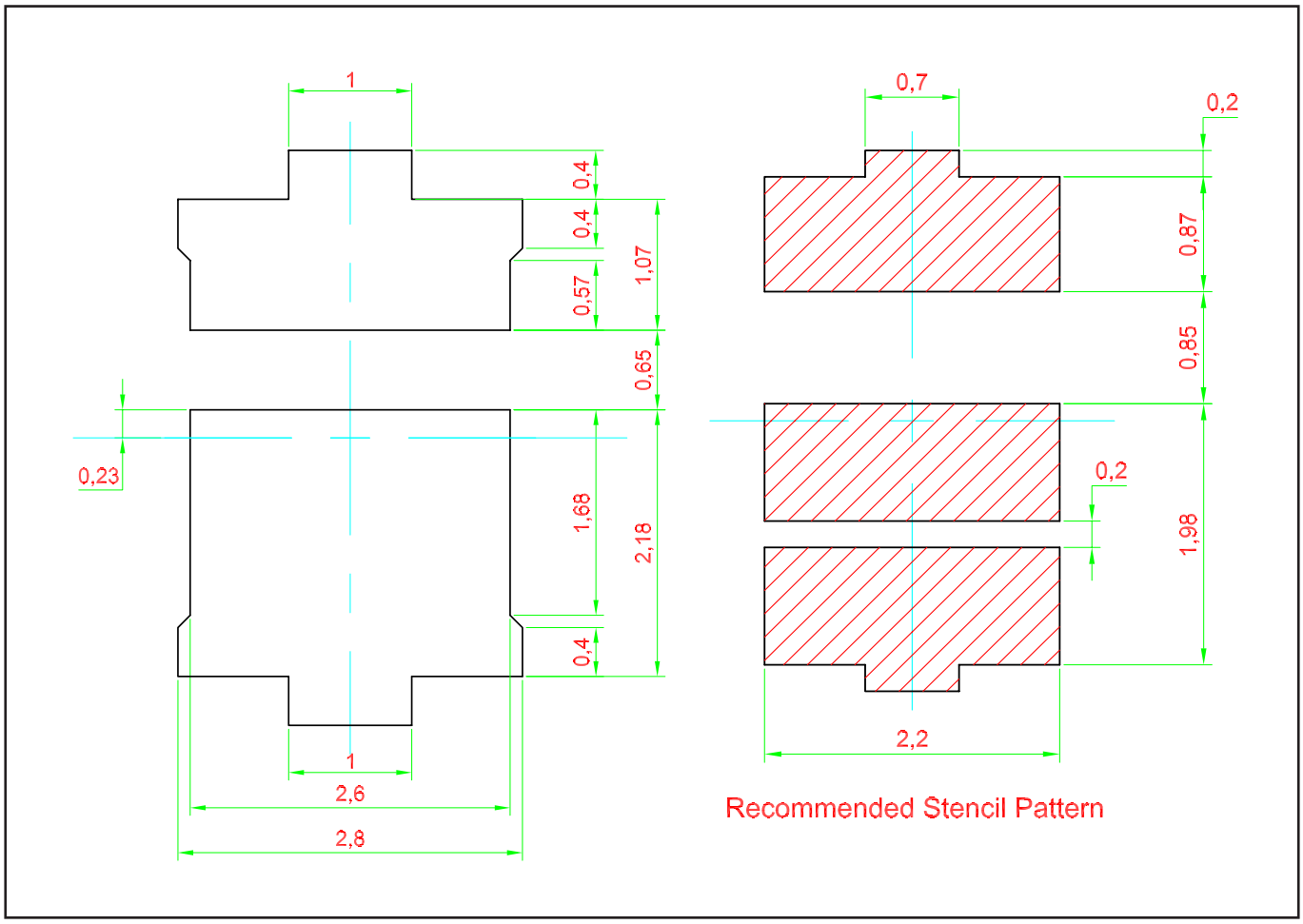


Notes:
Primary thermal path is through Cathode lead of LED package.
General tolerance: +/- 0.1mm.

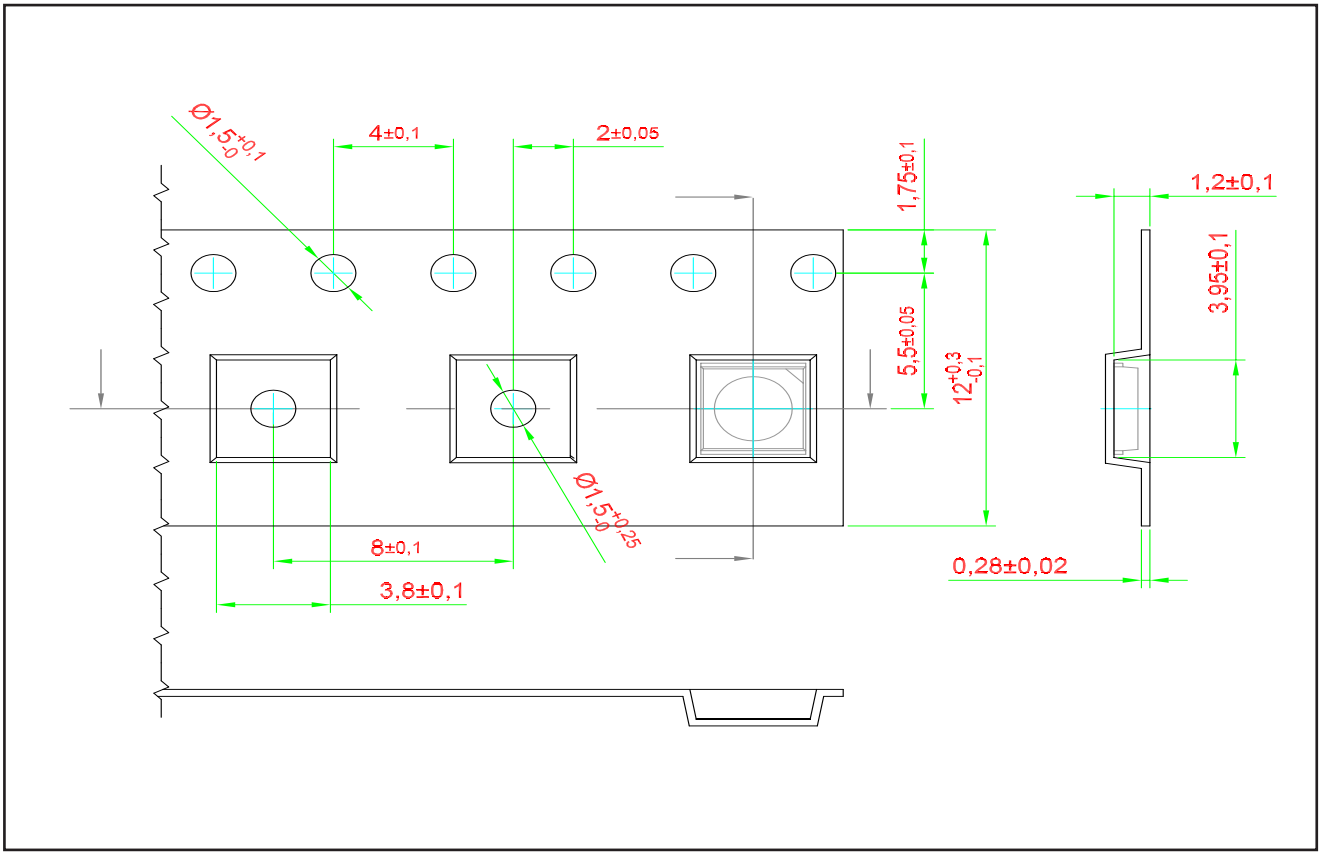
Material

	Material
Lead-frame	Cu Alloy With Au Plating
Package	High Temperature Resistant Plastic
Encapsulant	Silicone Resin
Soldering Leads	Au Plating

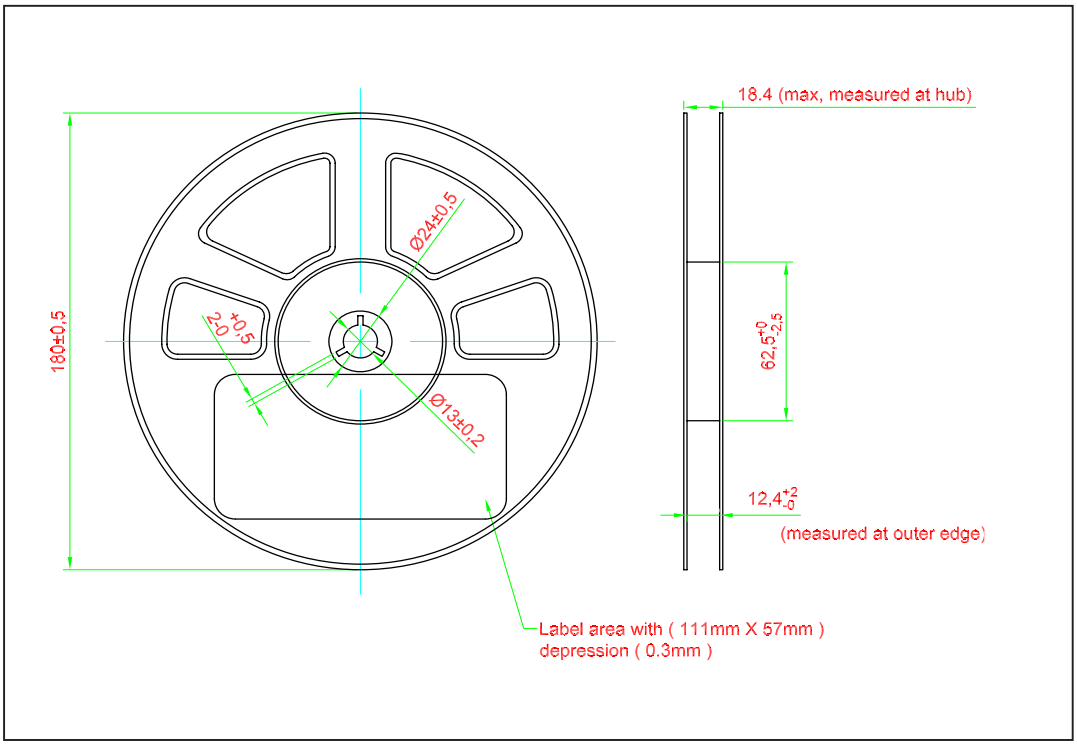
Recommended Solder Pad

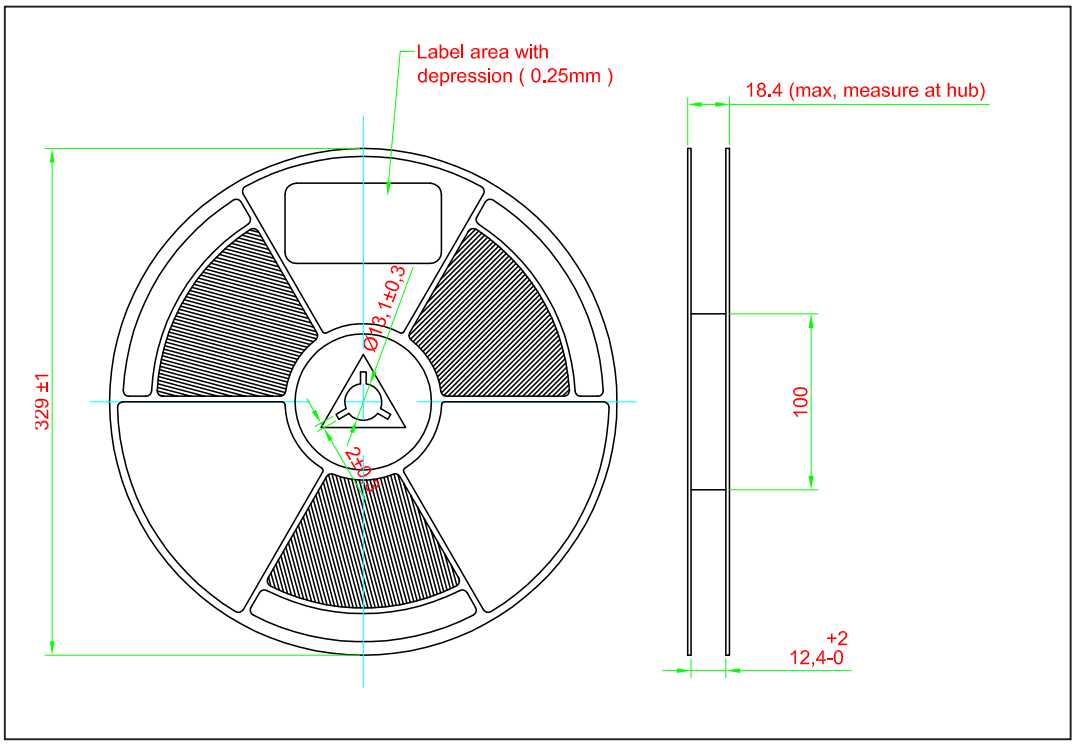


Taping and orientation



Packaging Specification



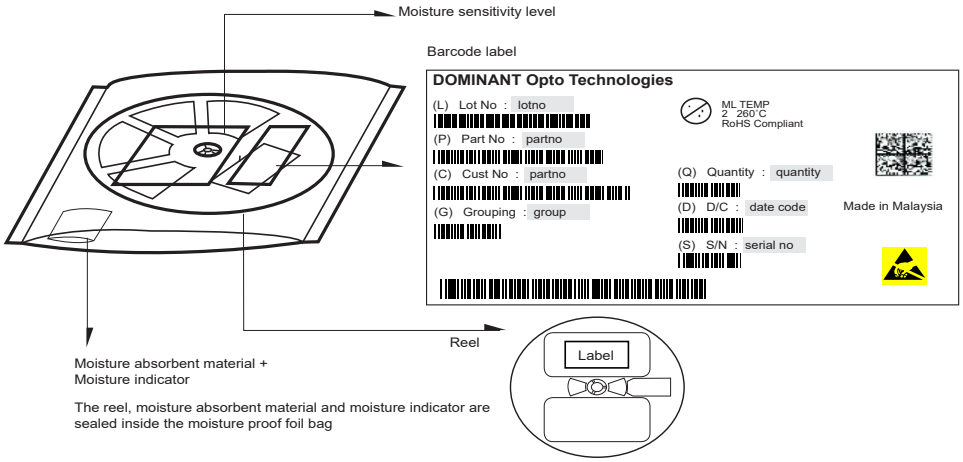


	Reel Diameter (mm)	Quantity (pcs)	*Ordering Number
Standard Packing	180	1500	MAF-EHJ-xxx-x
Optional Packing	329	5000	MAF-EHJ-xxx-x-5

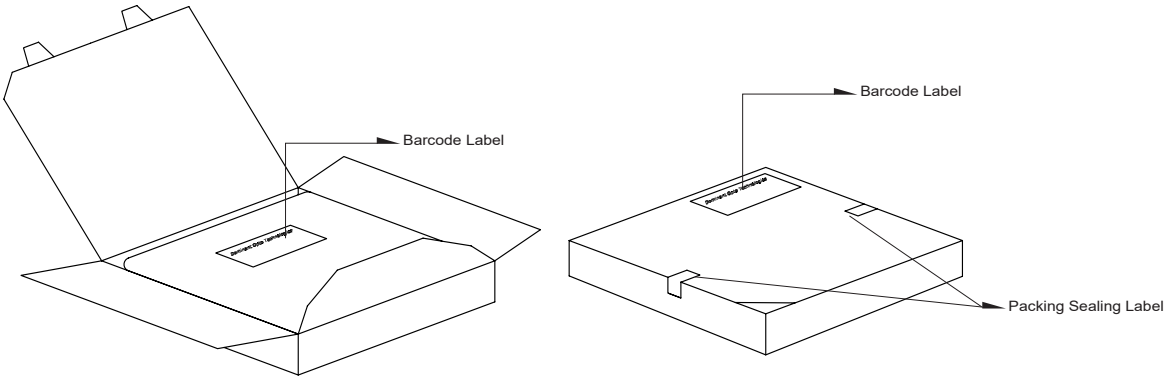
Notes:

* For ordering purpose only. Please consult sales and marketing for details.

Packaging Specification



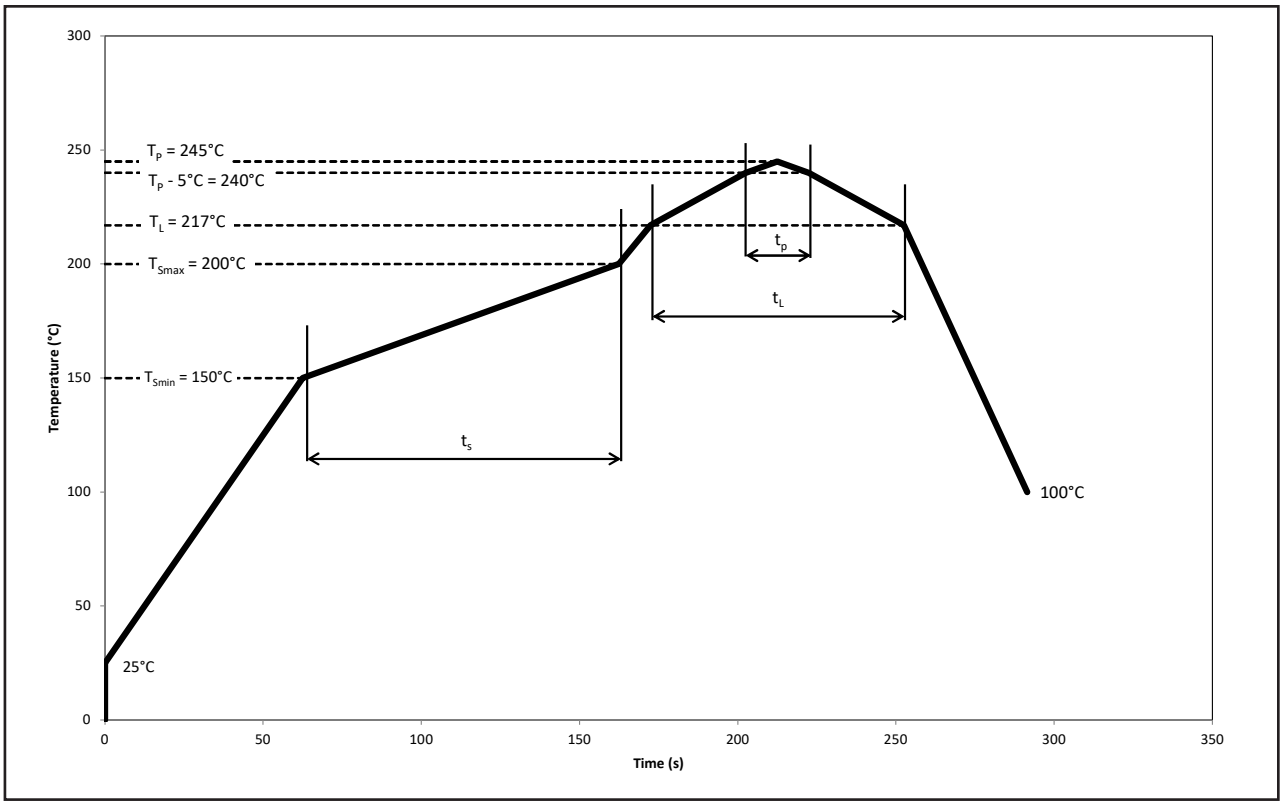
Quantity per bag (pcs)	Average 1pc PrimaxPlus (g)	1 completed bag (g)
1500	0.034	245 ± 10
5000	0.034	1150 ± 10



Reel Diameter (mm)	Packing Box Dimensions (mm)
180	210 x 210 x 20
329	345 x 345 x 20

Recommended Pb-free Soldering Profile

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



Profile Feature	Symbol	Pb-Free Assembly			Unit
		Min.	Recommended	Max.	
Ramp-up rate to preheat 25°C to T_{smin}	-	-	2	3	°C/s
Time t_S T_{smin} to T_{smax}	t_S	60	100	120	s
Ramp-up rate to peak T_L to T_P	-	-	2	3	°C/s
Liquidous temperature	T_L	-	217	-	°C
Time above liquidous temperature	t_L	60	80	150	s
Peak temperature	T_p	-	245	260	°C
Time within 5°C of the specified peak temperature T_P - 5°C	t_p	10	20	30	s
Ramp-down rate T_P to 100°C	-	-	3	6	°C/s
Time 25°C to T_P	-	-	-	480	s

Appendix

1) Brightness:

1.1 Luminous intensity is measured at current pulse 25 ms(typ) with an internal reproducibility of ± 8 % and an expanded uncertainty of ± 11 % (according to GUM with a coverage factor of k=3).

1.2 Luminous flux is measured at current pulse 25 ms(typ) with an internal reproducibility of ± 8 % and an expanded uncertainty of ± 11 % (according to GUM with a coverage factor of k=3).

1.3 Radiant intensity is measured at current pulse 25 ms(typ) with an internal reproducibility of ± 8 % and an expanded uncertainty of ± 11 % (according to GUM with a coverage factor of k=3).

1.4 Radiant flux is measured at current pulse 25 ms(typ) with an internal reproducibility of ± 8 % and an expanded uncertainty of ± 11 % (according to GUM with a coverage factor of k=3).

2) Color:

2.1 Chromaticity coordinate groups are measured at current pulse 25 ms(typ) with an internal reproducibility of ± 0.005 and an expanded uncertainty of ± 0.01 (accordingly to GUM with a coverage factor of k=3).

2.2 Dominant wavelength is measured at current pulse 25 ms(typ) with an internal reproducibility of ± 0.5nm and an expanded uncertainty of ± 1nm (accordingly to GUM with a coverage factor of k=3).

3) Voltage:

3.1 Forward Voltage, Vf is measured when a current pulse of 8 ms(typ) with an internal reproducibility of ± 0.05V and an expanded uncertainty of ± 0.1V (accordingly to GUM with a coverage factor of k=3).

4) Typical Values:

4.1 At special conditions of LED manufacturing processes, typical data or calculated correlations of technical parameters only reflect the statistical figures. But not necessarily correspond to the actual parameters of each single product, which could differ from the typical data or calculated correlations or the typical characteristic line. These typical data may change whenever technical improvements happen.

5) Tolerance of Measure

5.1 Unless otherwise noted in drawing, tolerances are specified with ± 0.1 and dimension are specific in mm.

6) Reverse Voltage:

6.1 Not designed for reverse operation. Continuous reverse voltage can cause migration and LED damage.

Revision History

Page	Subjects	Date of Modification
-	Initial Release	25 Jul 2018
2	Update Notes Add Test Condition for Thermal Resistance	28 May 2019
5	Update Graph: Chromaticity Coordinate Shift Vs Forward Current	06 Sep 2019
10, 11, 12	Update Packaging Specification Update Recommended Pb-free Soldering Profile	11 Mar 2022
2	Not for New Design: MAF-EHJ-Q3R-5J8Q & MAF-EHJ-QR2-5R8X	29 Dec 2022
10, 11	Update Quantity per Reel: 1000pcs to 1500pcs	26 Oct 2023

NOTE

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Dispose of product is in accordance with local, regional, national and international regulations.

About Us

DOMINANT Opto Technologies is a dynamic company that is amongst the world's leading automotive LED manufacturers. With an extensive industry experience and relentless pursuit of innovation, DOMINANT's state-of-art manufacturing and development capabilities have become a trusted and reliable brand across the globe. More information about DOMINANT Opto Technologies, an IATF 16949 and ISO 14001 certified company, can be found under http://www.dominant-semi.com.

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