DOMINANT™
Opto Technologies
Innovating Illumination

DATA SHEET:

DomiLED

AlInGaP : DDx-xJS

DomiLED

Synonymous with function and performance, the DomiLED series is perfectly suited for a variety of cross-industrial applications due to its small package outline, durability and superior brightness.

Features:

> High brightness surface mount LED.
> 120° viewing angle.
> Small package outline (LxWxH) of 3.2 x 2.8 x 1.8mm.
> Qualified according to JEDEC moisture sensitivity Level 2.
> Compatible to IR reflow soldering.
> Environmental friendly; RoHS compliance.
> Compliance to AEC-Q102 Standard.
> Passed corrosion test.

Applications:

> Automotive: interior applications, eg: switches, telematics, climate control system, dashboard, etc.
> Consumer appliances: LCD illumination as in PDAs, LCD TV.
> Communication: indicator and backlight in mobilephone.
> Display: full color display video notice board.
> Industrial: white goods (eg: Oven, microwave, etc.).

Optical Characteristics at Tj=25˚C

Part Number	Color	Viewing Angle˚	Luminous Intensity @ 20mA IV (mcd) Appx. 1.1 Min.	Typ.	Max.
● DDH-CJS-PQ2-1	Hyper-red, 640nm	120	45.00	71.50	112.50
● DDS-CJS-PQ2-1	Super-red, 632nm	120	45.00	71.50	112.50
● DDS-CJS-QR2-1	Super-red, 632nm	120	71.50	112.50	180.00
● DDS-CJS-RS2-1	Super-red, 632nm	120	112.50	180.00	285.00
● DDR-CJS-RS2-1	Red, 625nm	120	112.50	180.00	285.00
● DDR-CJS-ST1-1	Red, 625nm	120	180.00	285.00	355.00
● DDA-CJS-RS2-1	Amber, 615nm	120	112.50	180.00	285.00
● DDA-CJS-ST2-1	Amber, 615nm	120	180.00	285.00	450.00
● DDO-CJS-RS2-1	Orange, 605nm	120	112.50	180.00	285.00
● DDO-CJS-ST2-1	Orange, 605nm	120	180.00	285.00	450.00
● DDY-CJS-QR2-1	Yellow, 587nm	120	71.50	112.50	180.00
● DDY-CJS-RS2-1	Yellow, 587nm	120	112.50	180.00	285.00
● DDY-CJS-ST2-1	Yellow, 587nm	120	180.00	285.00	450.00
● DDG-CJS-PQ2-1	Green, 572nm	120	45.00	71.50	112.50
● DDG-CJS-QR2-1	Green, 572nm	120	71.50	112.50	180.00
● DDP-CJS-LM2-1	Pure Green, 560nm	120	11.20	18.00	28.50

● Not for new design

Optical Characteristics at Tj=25˚C

Part Number	Color	Viewing Angle˚	Luminous Intensity @ 20mA IV (mcd) Appx. 1.1 Min.	Typ.	Max.
● DDS-SJS-QR2-1	Super-red, 632nm	120	71.50	112.50	180.00
● DDR-SJS-RS2-1	Red, 625nm	120	112.50	180.00	285.00
● DDR-TJS-TU2-1	Red, 625nm	120	285.00	450.00	715.00
● DDA-SJS-ST2-1	Amber, 615nm	120	180.00	285.00	450.00
● DDO-SJS-ST2-1	Orange, 605nm	120	180.00	285.00	450.00
● DDY-SJS-ST2-1	Yellow, 587nm	120	180.00	285.00	450.00
● DDY-TJS-TU2-1	Yellow, 587nm	120	285.00	450.00	715.00
● DDG-SJS-QR2-1	Green, 572nm	120	71.50	112.50	180.00
● DDP-SJS-LM2-1	Pure Green, 560nm	120	11.20	18.00	28.50
● DDP-SJS-MN2-1	Pure Green, 560nm	120	18.00	28.50	45.00

● Not for new design

Electrical Characteristics at Tj=25˚C

Part Number	Vf @ If = 20mA Appx. 3.1			Vr @ Ir = 10uA Appx. 6.1
	Min. (V)	Typ. (V)	Max. (V)	Min. (V)
DDx-CJS	1.6	1.9	2.3	12
DDx-SJS	1.6	1.8	2.3	12
DDx-TJS	1.6	2.1	2.6	12

Absolute Maximum Ratings

		Maximum Value	Unit
DC forward current		30	mA
Peak pulse current; (tp ≤ 10µs, Duty cycle = 0.005)	DDx-SJS/DDx-TJS : DDx-CJS :	1000 500	mA
Reverse voltage Appx. 6.1		12	V
ESD threshold (HBM)		2	kV
LED junction temperature		125	˚C
Operating temperature		-40 … +110	˚C
Storage temperature		-40 … +110	˚C
Power dissipation (at room temperature)		75	mW
Thermal resistance (Rated current = 20mA, Ts = 25 ˚C) - Junction / ambient, $R_{th\ JA}$ - Junction / solder point, $R_{th\ JS}$		 500 250	 K/W K/W

Wavelength Grouping at Tj=25˚C

Color	Group	Wavelength distribution (nm) *Appx. 2.2*
DDH; Hyper-red	Full	636 - 646
DDS; Super-red	Full	625 - 640
DDR-CJ, -SJ; Red (AS)	Full	620 - 630
DDR-TJ; Red (TS)	Full	620 - 635
DDA; Amber	Full	610 - 621
	W	610 - 615
	X	615 - 621
DDO; Orange	Full	600 - 612
	W	600 - 603
	X	603 - 606
	Y	606 - 609
	Z	609 - 612
DDY; Yellow	Full	582 - 594
	W	582 - 585
	X	585 - 588
	Y	588 - 591
	Z	591 - 594
DDG; Green	Full	564.5 - 576.5
	W	564.5 - 567.5
	X	567.5 - 570.5
	Y	570.5 - 573.5
	Z	573.5 - 576.5
DDP; Pure Green	Full	552.5 - 564.5
	W	552.5 - 555.5
	X	555.5 - 558.5
	Y	558.5 - 561.5
	Z	561.5 - 564.5

Luminous Intensity Group at Tj=25˚C

Brightness Group	Luminous Intensity *Appx. 1.1* IV (mcd)
L1	11.2...14.0
L2	14.0...18.0
M1	18.0...22.4
M2	22.4...28.5
N1	28.5...35.5
N2	35.5...45.0
P1	45.0...56.0
P2	56.0...71.5
Q1	71.5...90.0
Q2	90.0...112.5
R1	112.5...140.0
R2	140.0...180.0
S1	180.0...224.0
S2	224.0...285.0
T1	285.0...355.0
T2	355.0...450.0
U1	450.0...560.0
U2	560.0...715.0

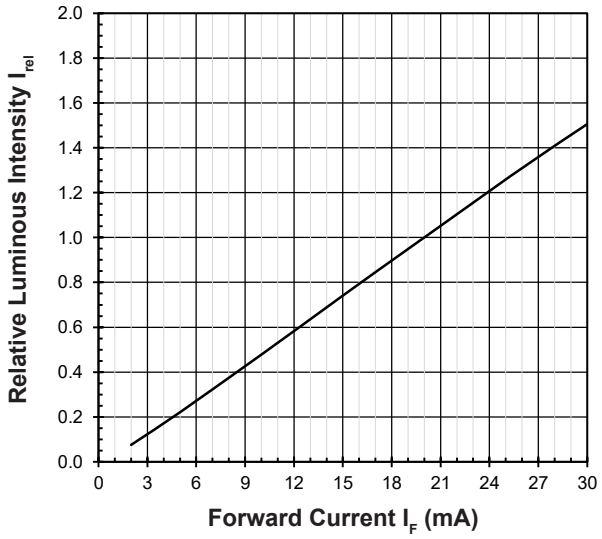
Vf Binning (Optional) at Tj= 25˚C

Vf Bin @ 20mA	Forward Voltage (V) *Appx. 3.1*
01	1.55 … 1.85
02	1.85 … 2.15
03	2.15 … 2.45
04	2.45 … 2.75

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

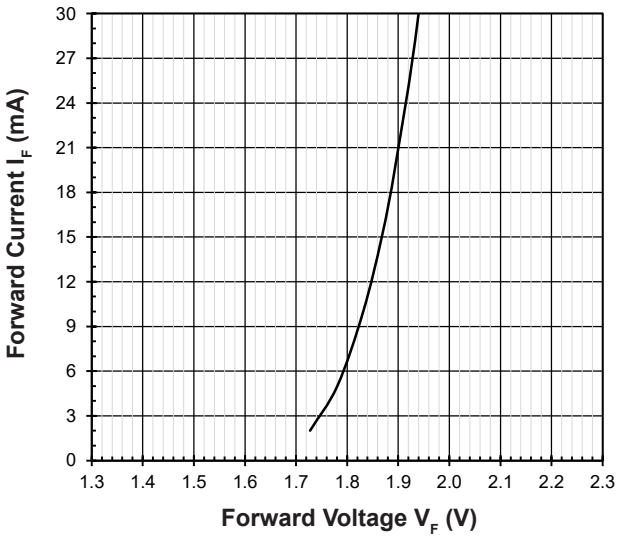
Relative Luminous Intensity Vs Forward Current *Appx. 4.1*

$I_V/I_V(20mA) = f(I_F)$; $T_j = 25°C$



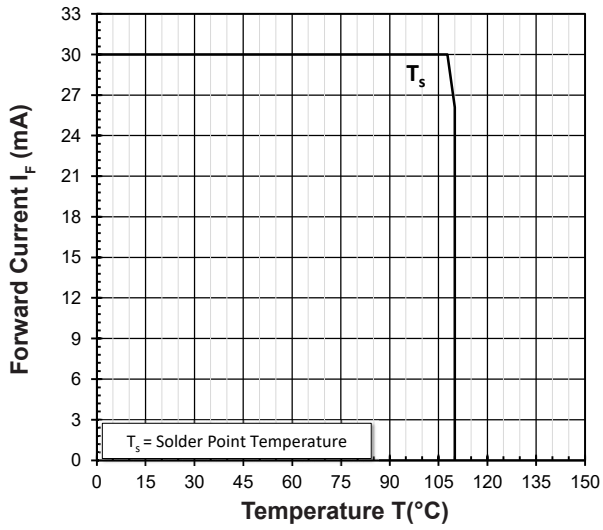
Forward Current Vs Forward Voltage *Appx. 4.1*

$I_F = f(V_F)$; $T_j = 25°C$



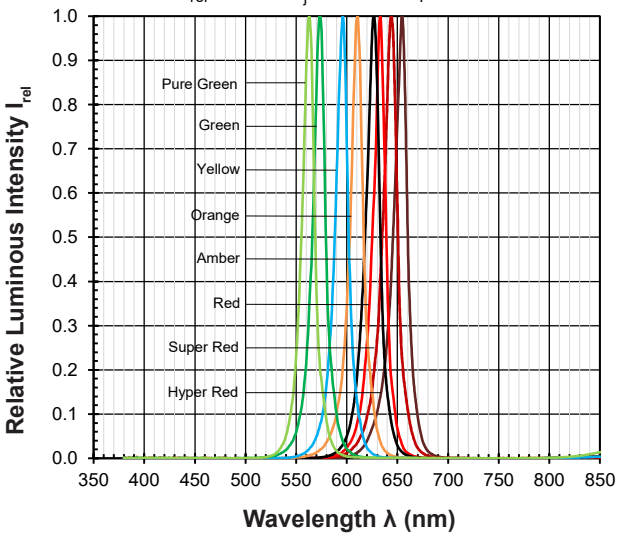
Maximum Current Vs Temperature

$I_F = f(T)$



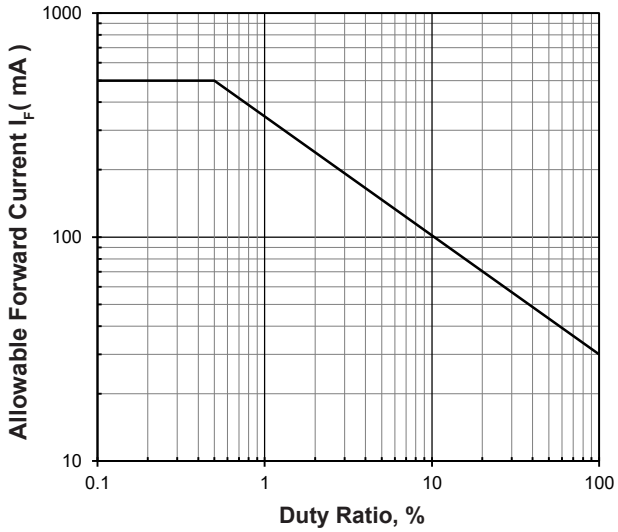
Relative Spectral Emission *Appx. 4.1*

$I_{rel} = f(\lambda)$; $T_j = 25°C$; $I_F = 20mA$

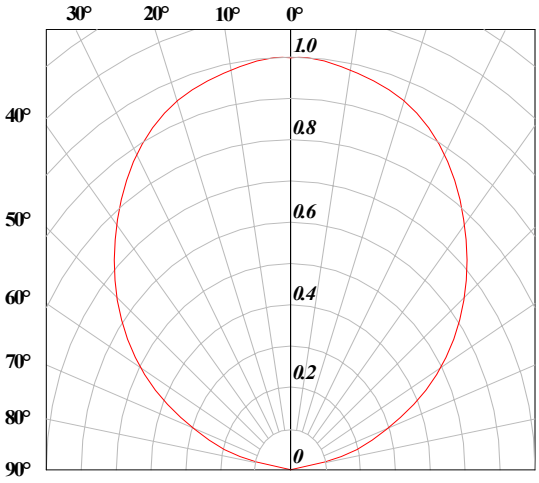


Allowable Forward Current Vs Duty Ratio

(Ts = 55°C; tp =10µs)

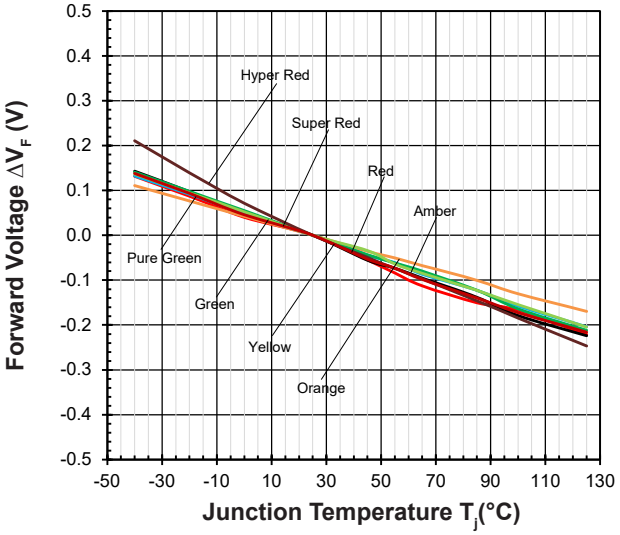


Radiation Pattern *Appx. 4.1*



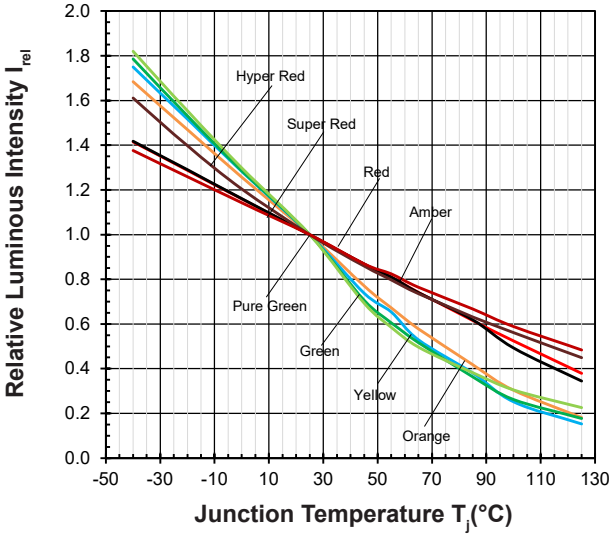
Forward Voltage Vs Junction Temperature *Appx. 4.1*

$\Delta V_F = V_F - V_F(25°C) = f(T_j)$; I_F =20mA



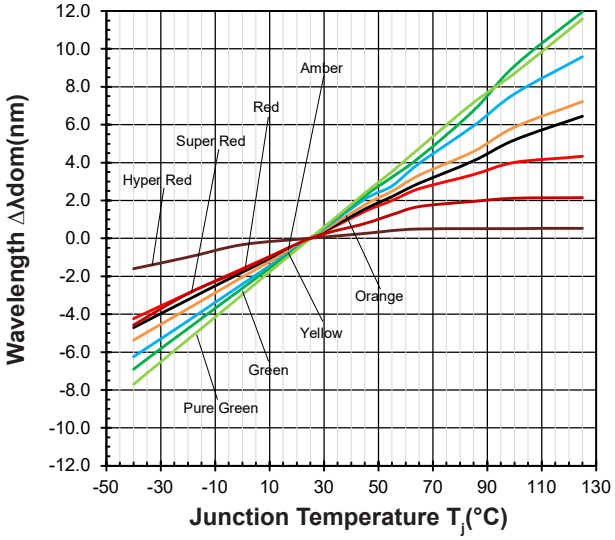
Relative Luminous Intensity Vs Junction Temperature *Appx. 4.1*

$I_V/I_V(25°C) = f(T_j)$; I_F = 20mA

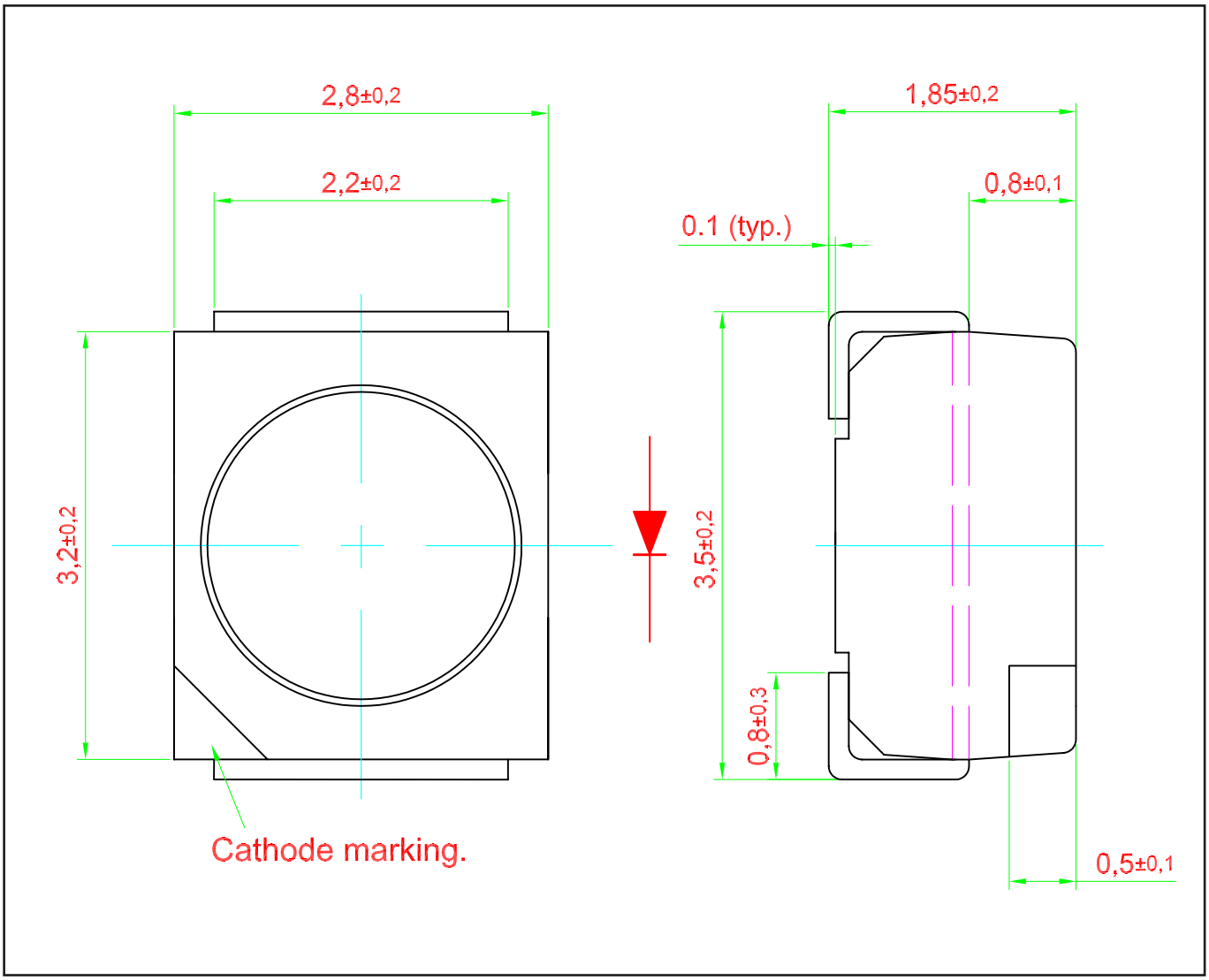


Wavelength Vs Junction Temperature *Appx. 4.1*

$\Delta\lambda dom = \lambda dom - \lambda dom\ (25°C) = f(T_j)$; I_F = 20mA



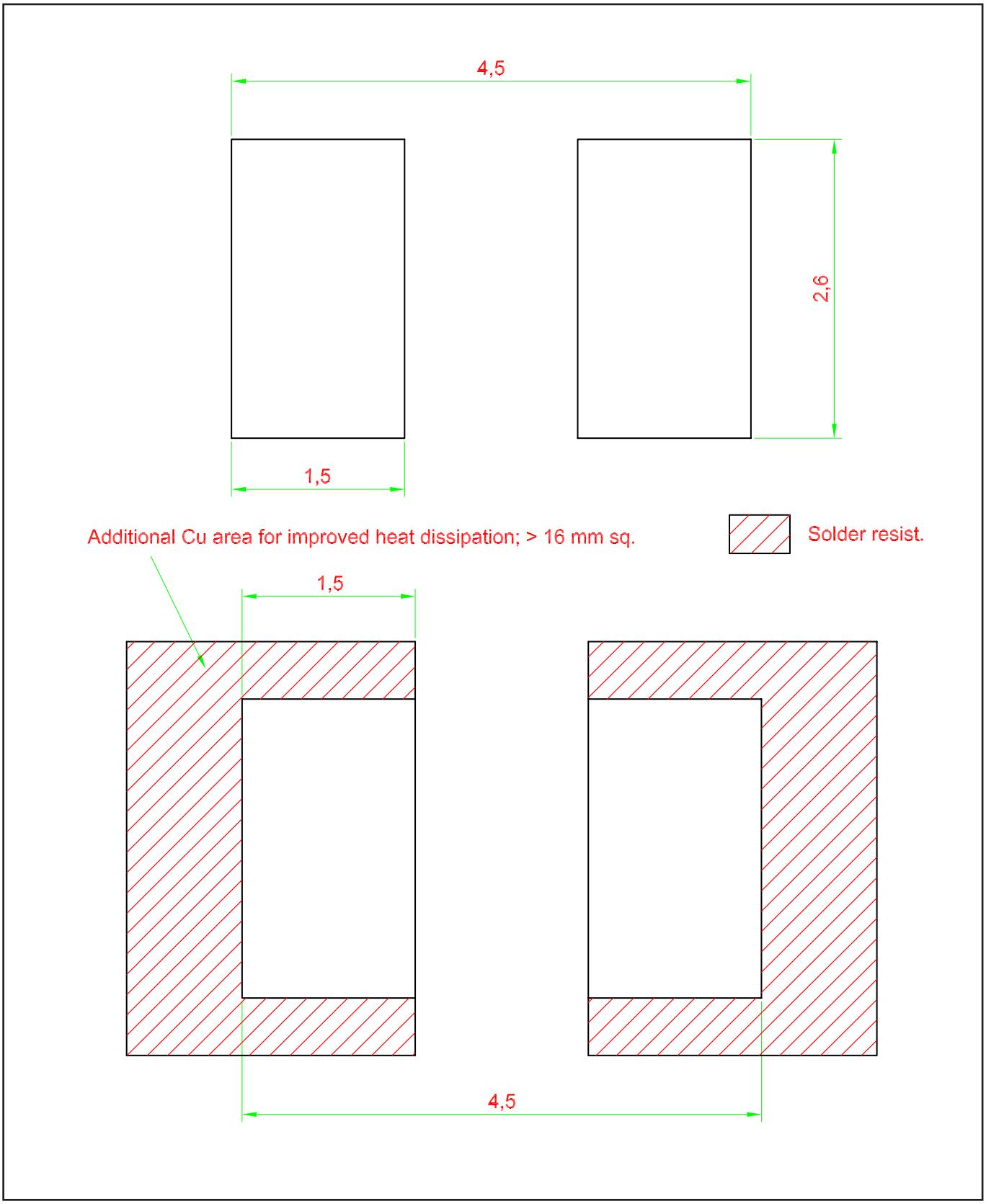
DomiLED • AlInGaP : DDx-xJS Package Outlines *Appx. 5.1*



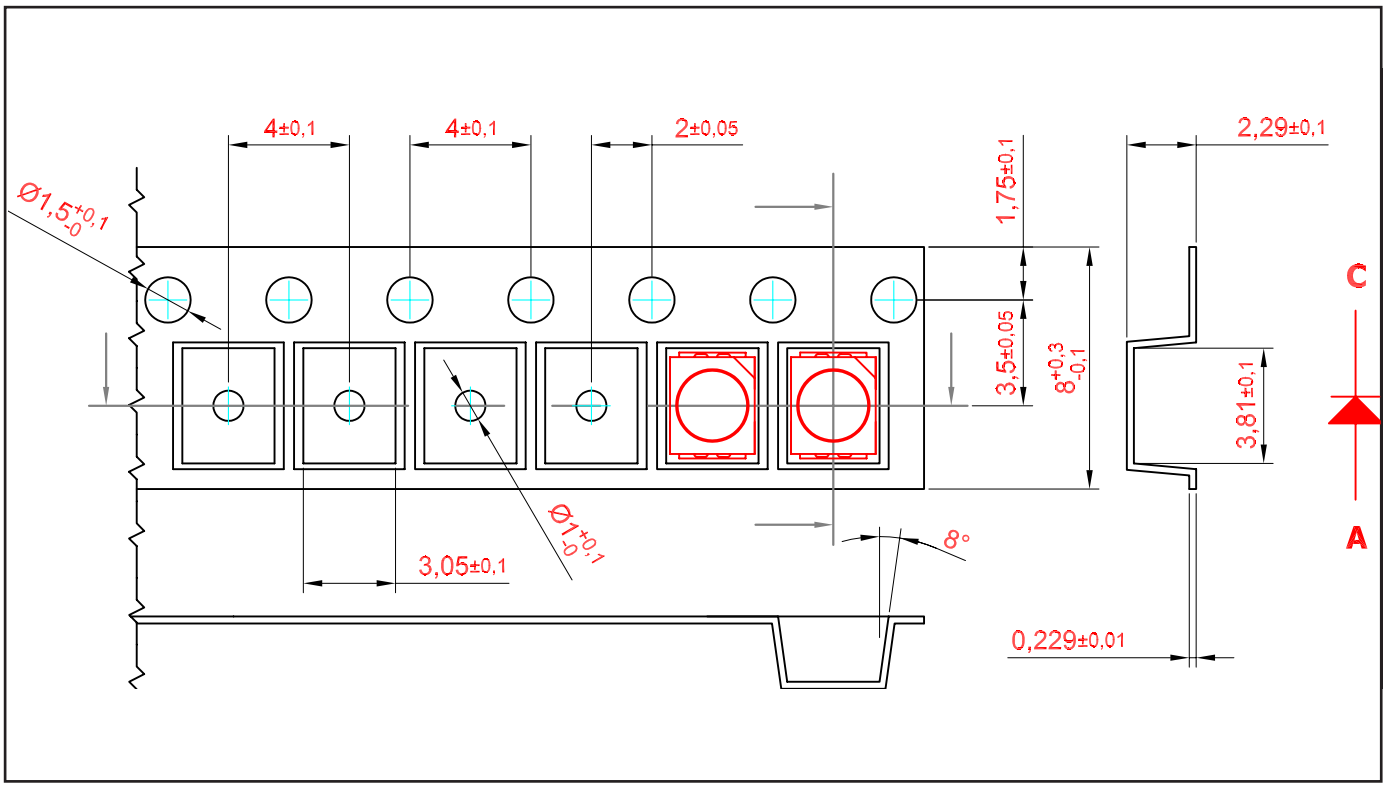
Material

	Material
Lead-frame	Cu Alloy With Ag Plating
Package	High Temperature Resistant Plastic
Encapsulant	Epoxy Resin
Soldering Leads	Sn Plating

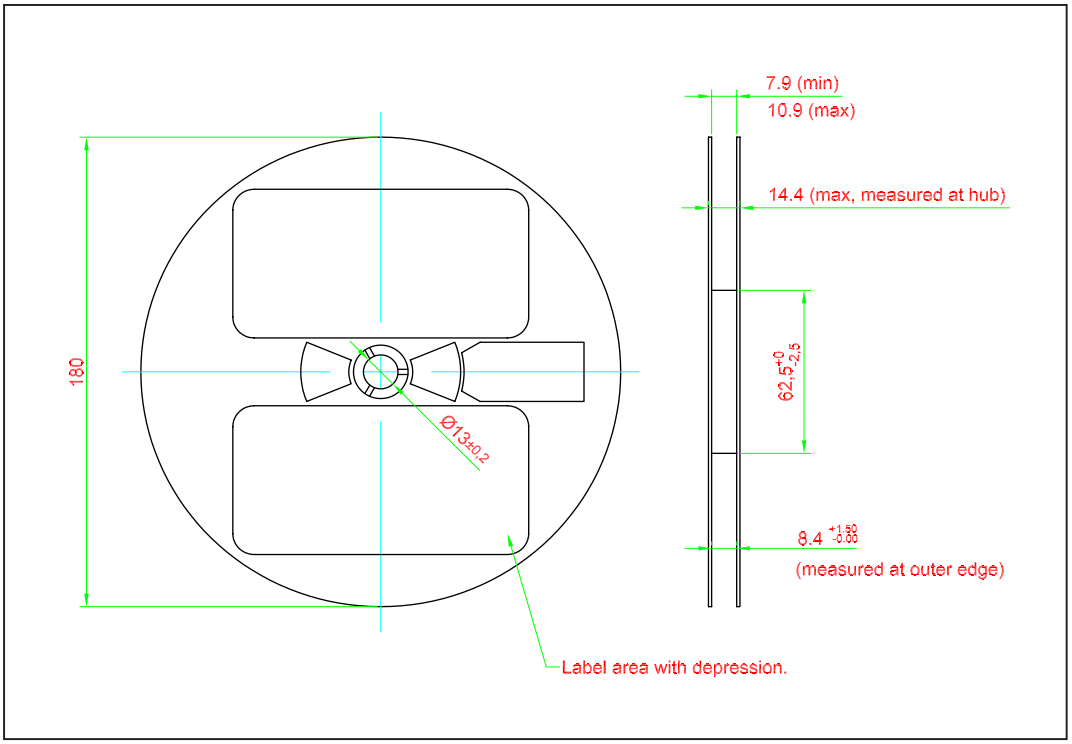
Recommended Solder Pad *Appx. 5.1*

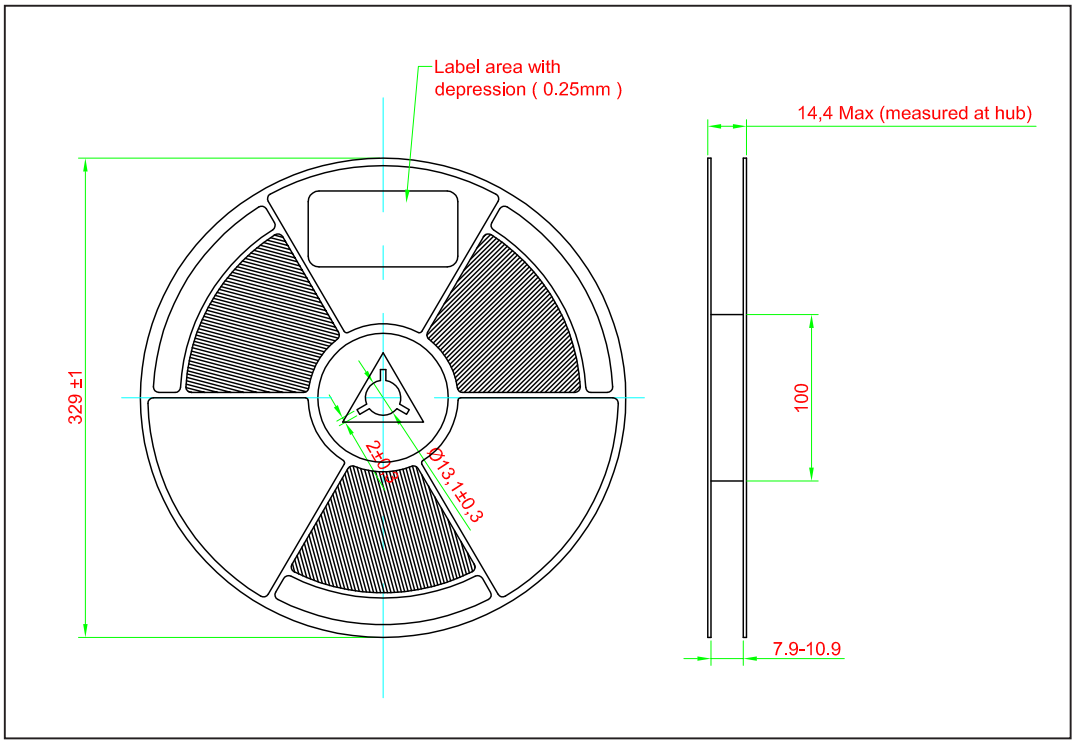


Taping and orientation *Appx. 5.1*



Packaging Specification



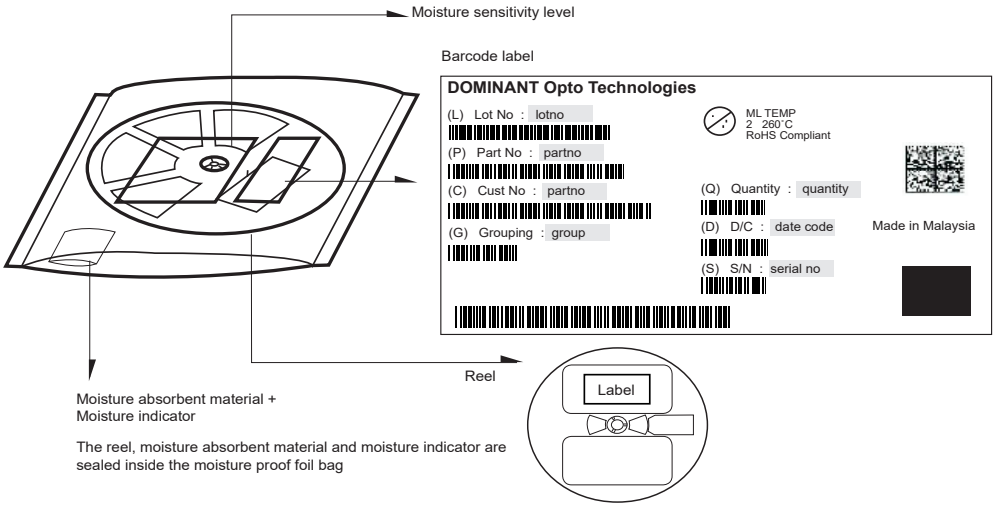


	Reel Diameter (mm)	Quantity (pcs)	*Ordering Number
Standard Packing	180	2000	DDx-xJS-xxx-x
Optional Packing	329	8000	DDx-xJS-xxx-x-8

Notes:

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

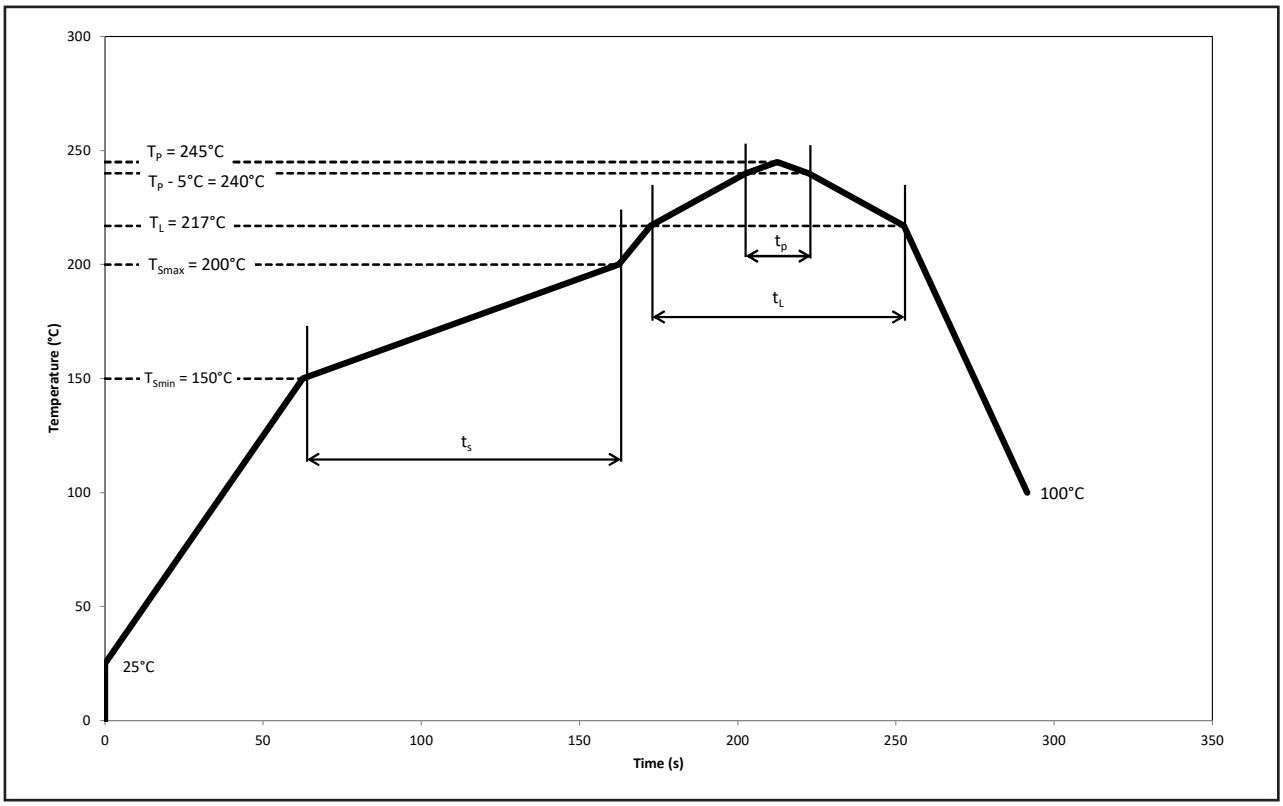
Packaging Specification



Quantity per bag (pcs)	Average 1pc DomiLED (g)	1 completed bag (g)
2000	0.034	240 ± 10
8000	0.034	750 ± 10

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 Due to the specific conditions of semiconductor devices' manufacturing processes, the provided typical data and calculated correlations of technical parameters should only be considered as statistical values. It is important to note that the actual parameters of individual devices may deviate from these typical data, calculated correlations or the typical characteristic line. Dominant reserves the right to update this typical data without prior notice, particularly in response to technical enhancements.

5) Tolerance of Measure

5.1 Unless otherwise noted in drawing, tolerances are specified with ± 0.1 and dimension are specifiec 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
2	Add new partno: DDY-CJS-QR2-1 Not for new design: DDR-TJS-TU2-1, and DDY-TJS-TU2-1	10 Dec 2012
2	Add new partno: DDS-CJS-PQ2-1	03 Jan 2013
1, 3	Add Features Update packaging specification	16 Oct 2015
1	Update Product Photo	29 Apr 2016
12, 13, 14, 16	Update Packaging Specification Add Appendix	09 Apr 2019
1, 2, 4, 7, 8, 14	Update from AEC-Q101 to AEC-Q102 Add Features Not for New Design: DDP-SJS-LM2-1, DDP-SJS-MN2-1 Update Operating and Storage Temperature Add Thermal Resistance Update Graph Update Recommended Pb-free Soldering Profile	20 Apr 2022
2, 13	Not for New Design: DDH-CJS-PQ2-1, DDS-CJS-PQ2-1, DDS-CJS-QR2-1, DDS-CJS-RS2-1, DDR-CJS-RS2-1, DDR-CJS-ST1-1, DDA-CJS-RS2-1, DDA-CJS-ST2-1, DDO-CJS-RS2-1, DDO-CJS-ST2-1, DDY-CJS-QR2-1, DDY-CJS-RS2-1, DDY-CJS-ST2-1, DDG-CJS-PQ2-1, DDG-CJS-QR2-1, DDP-CJS-LM2-1 Update Packaging Specification	18 Feb 2025

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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