Kingbright

Optoelectronic Components

TECHNICAL NOTES

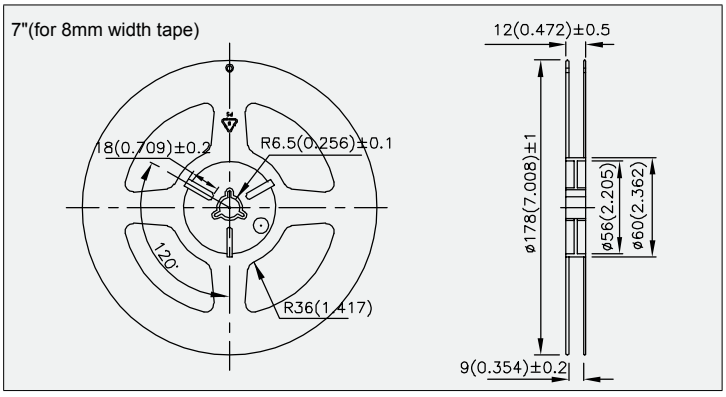
Quality Efficiency Service Innovation

2013-2015

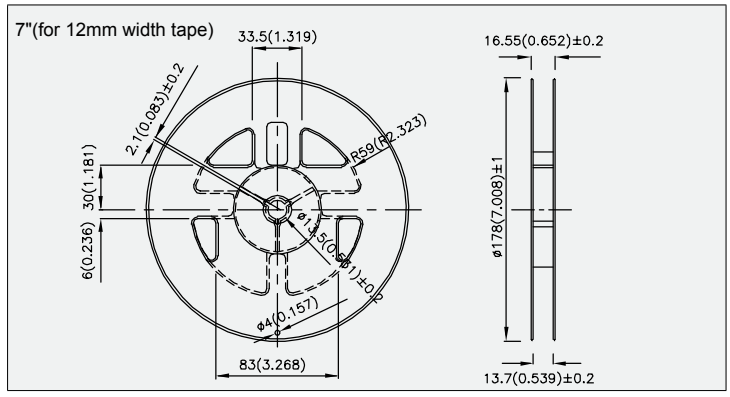
SMD TAPE SPECIFICATIONS

Reel Dimensions	Part Number		Reel Dimensions	Part Number	Reel Dimensions	Part Number
7"(for 8mm width tape)	KA-2214 KA-2810A KA-3021 KM-23-F KM-23xxx KP-1608 KP-2012 KP-23-F KP-23xxx KP-3216 KPA-1606 KPA-2106 KPA-3010 KPA-3210 KPB-3025 KPBA-3010 KPBD-3224 KPBDA-3020-PF KPBL-3025 KPD-3224 KPFA-3010-11	KPG-1608 KPH-1608 KPHBM-2012 KPHCM-2012 KPHHS-1005 KPJA-2107 KPL-3015 KPS-3227SP1C KPT-1608 KPT-2012 KPT-3216 KPTB-1612 KPTB-1615 KPTD-1608 KPTD-3216 KPTF-1616-13 KPTL-3216 KPTR-3216	7"(for 12mm width tape)	KA-2735 KA-3022-4.5SF KA-3528 KA-3529A KA-4008 KA-4040 KA-5630 KAA-3528 KAA-3528-11 KAAF-3529-11-C3 KAAF-5050-13 KAAF-5052 KM2520xxx03 KM2520xxx08 KM2520xxx09 KM-27xxx-03 KM-27xxx-09 KPED-3528 KPED-3820 KPS-5130PD7C KTDS-3535	13"(for 12mm width tape)	KA-3535
					13"(for 24mm width tape)	KCDX02 KCDX03 KCSX02 KCSX03 KCSX04 KT-1213
					13"(for 32mm width tape)	KCDX04 KCDX39 KCDX51 KCPDX04 KCPSX04 KCSX39 KCSX51 KCSX56
					13"(for 44mm width tape)	KCDX56

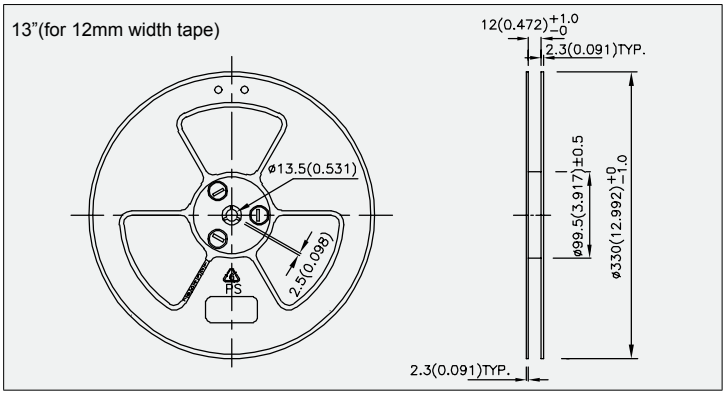
7"(for 8mm width tape)



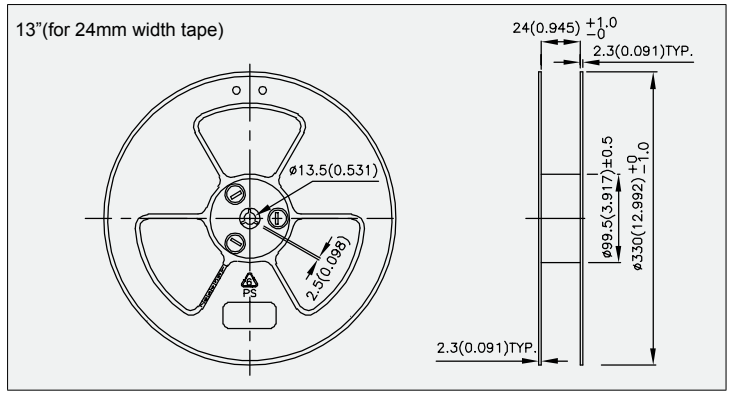
7"(for 12mm width tape)



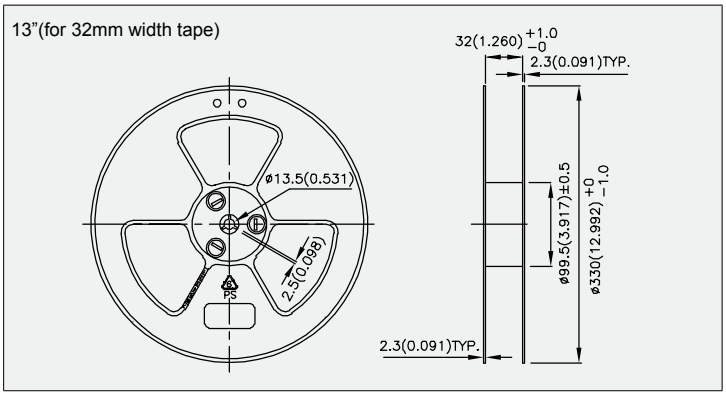
13"(for 12mm width tape)



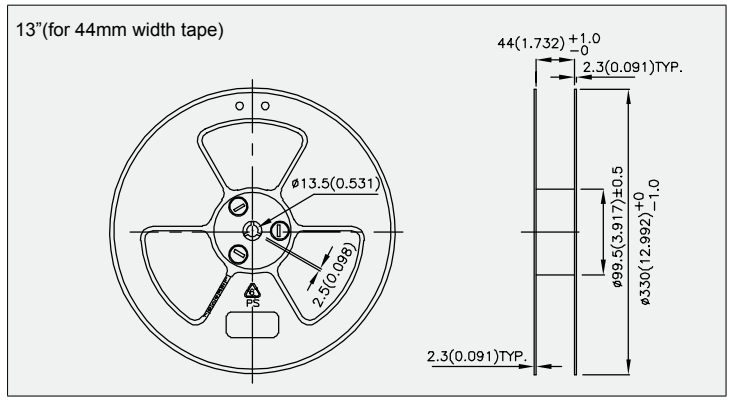
13"(for 24mm width tape)



13"(for 32mm width tape)



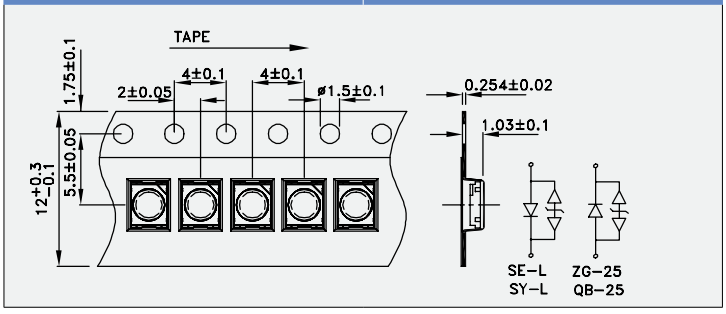
13"(for 44mm width tape)



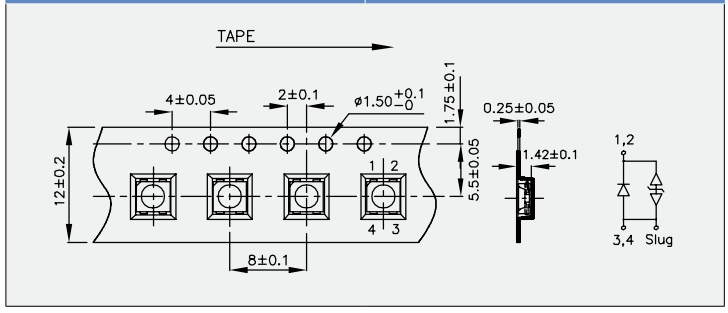
NOTE: 1. All dimensions are in millimeters(inches).

SMD TAPE SPECIFICATIONS

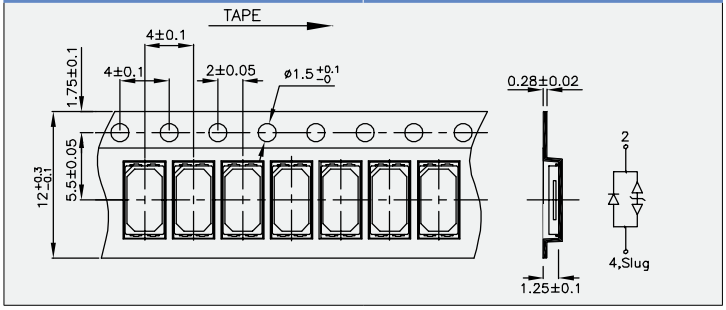
KA-3529A — PACKAGE: 2000PCS / REEL



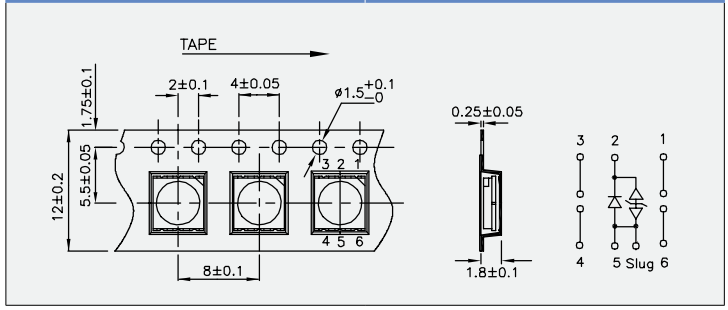
KA-3535 — PACKAGE: 2000PCS / REEL



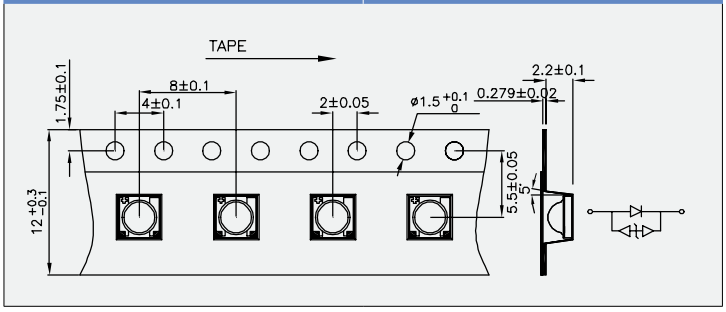
KA-5630 — PACKAGE: 2000PCS / REEL



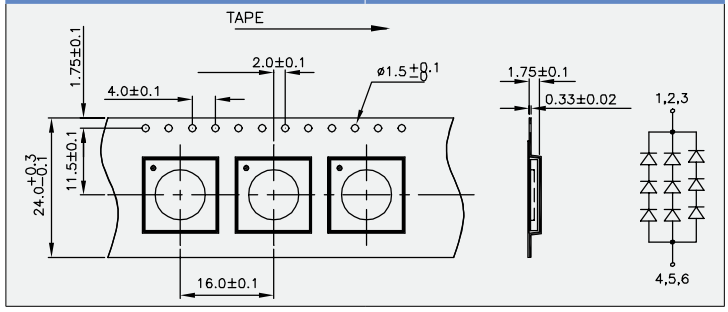
KAAF-5052 — PACKAGE: 500PCS / REEL



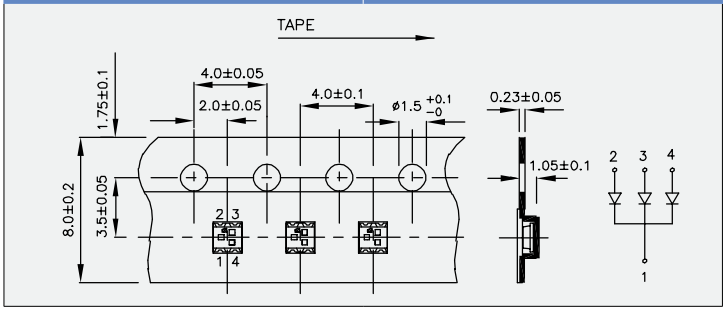
KTDS-3535 — PACKAGE: 1000PCS / REEL



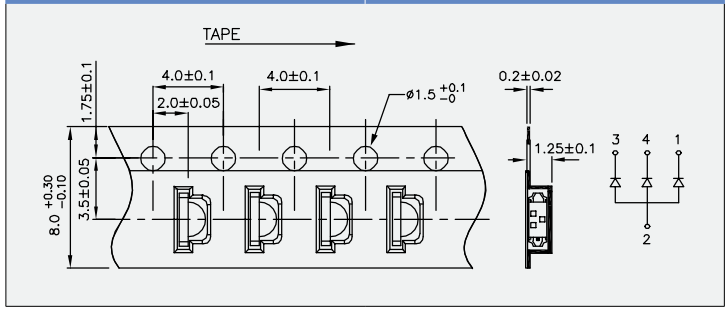
KT-1213 — PACKAGE: 500PCS / REEL



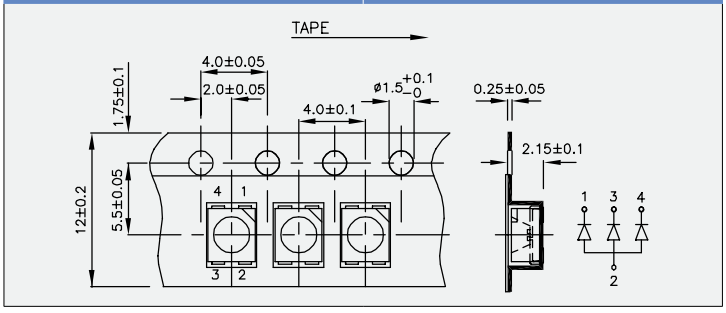
KPTF-1616RGBC-13 — PACKAGE: 2000PCS / REEL



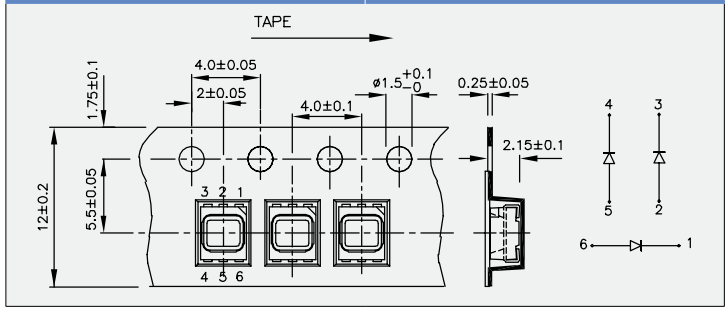
KPFA-3010RGBC-11 — PACKAGE: 2000PCS / REEL



KAA-3528RGBS-11 — PACKAGE: 2000PCS / REEL



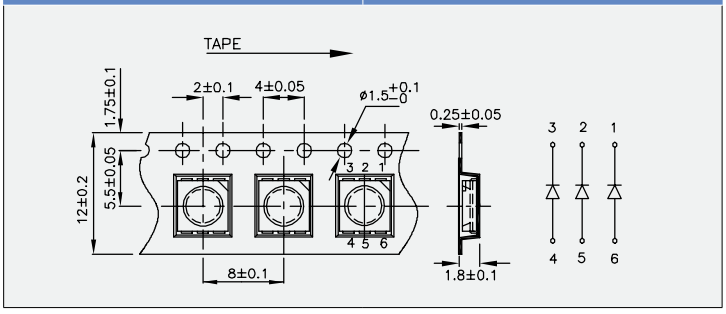
KAAF-3529RGBS-11-C3 — PACKAGE: 2000PCS / REEL



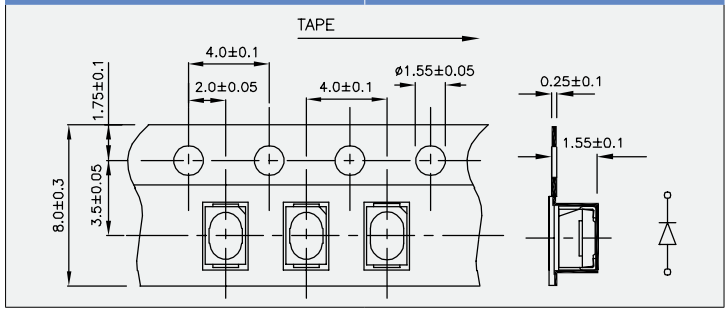
NOTE: 1. All dimensions are in millimeters.

SMD TAPE SPECIFICATIONS

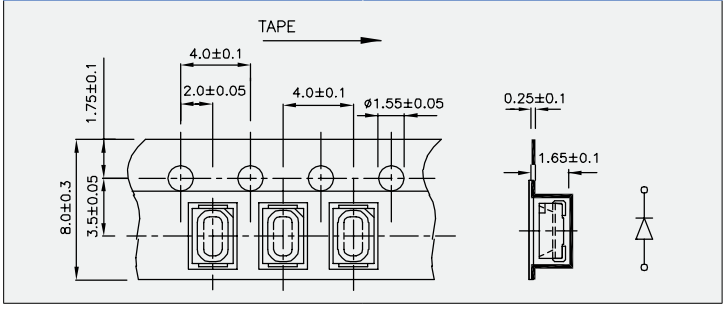
KAAF-5050RGBS-13 | PACKAGE: 500PCS / REEL



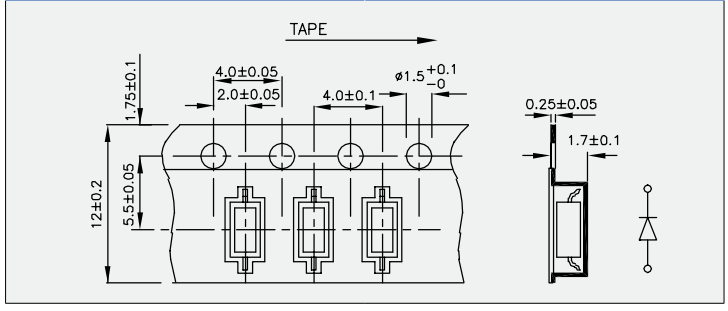
KA-2214 | PACKAGE: 2000PCS / REEL



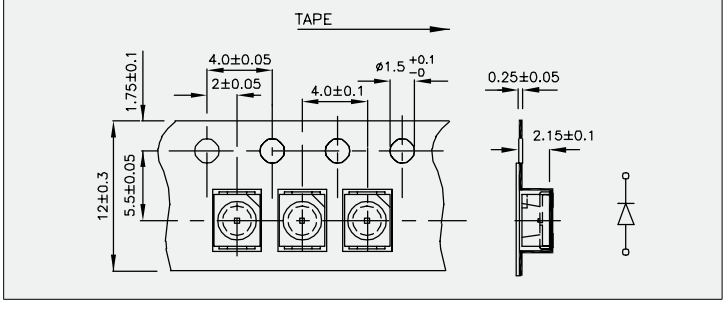
KA-3021 | PACKAGE: 2000PCS / REEL



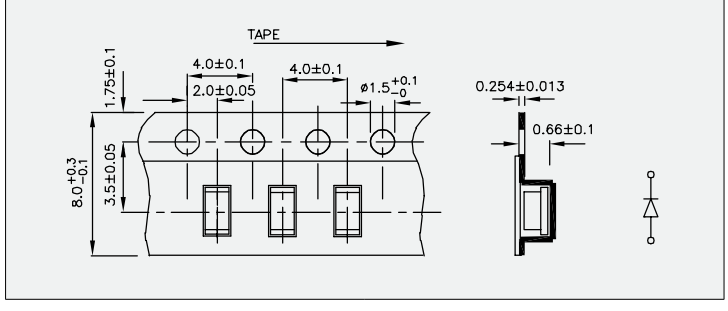
KA-3022-4.5SF | PACKAGE: 1500PCS / REEL



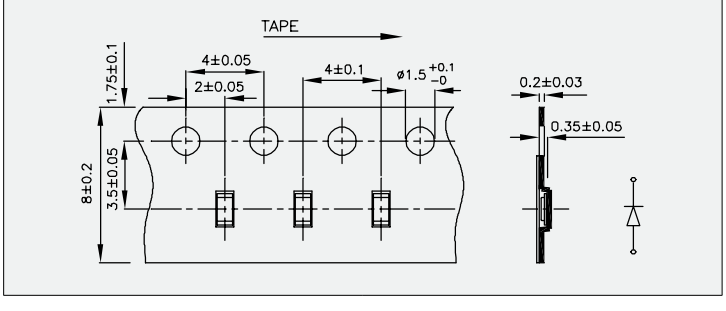
KA-3528 | PACKAGE: 2000PCS / REEL



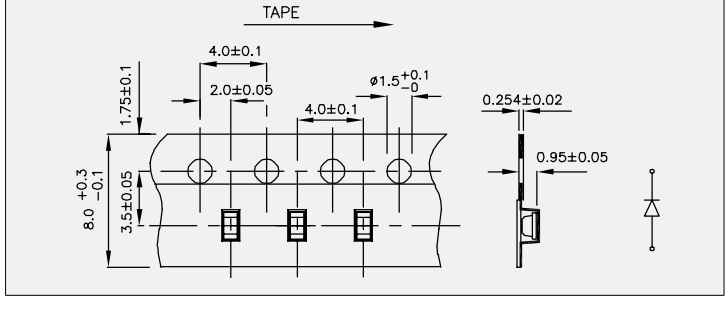
KPHHS-1005 | PACKAGE: 2000PCS / REEL



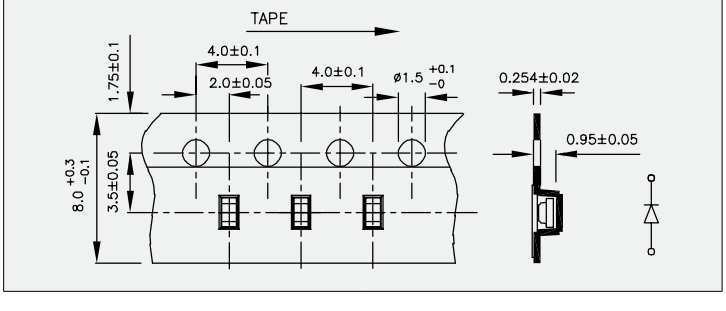
KPG-1608 | PACKAGE: 2000PCS / REEL



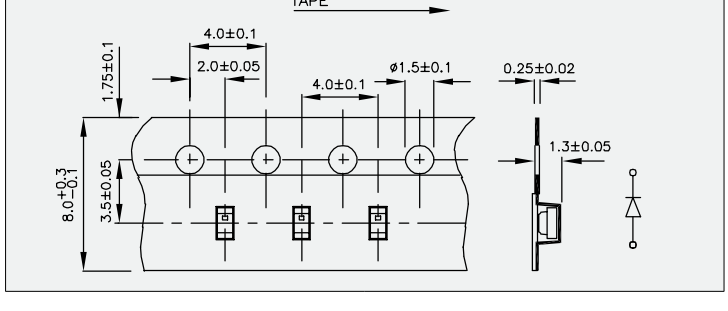
KPH-1608 | PACKAGE: 2000PCS / REEL



KPT-1608 | PACKAGE: 2000PCS / REEL



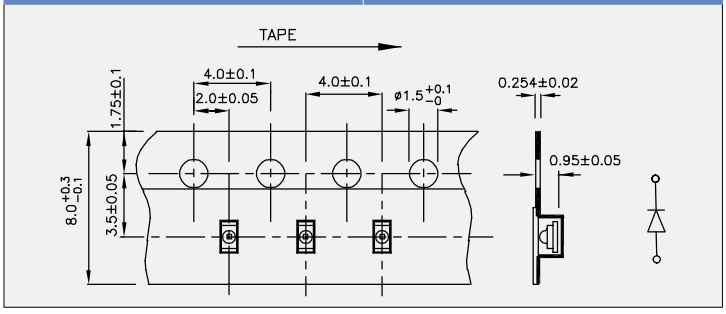
KP-1608 | PACKAGE: 2000PCS / REEL



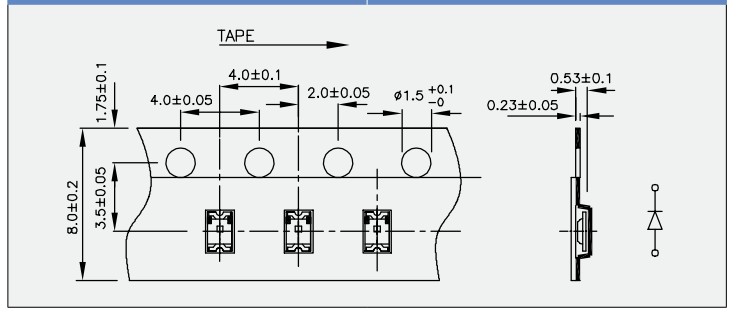
NOTE: 1. All dimensions are in millimeters.

SMD TAPE SPECIFICATIONS

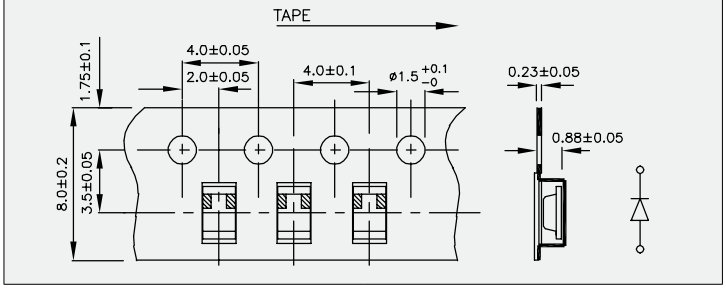
KPTD-1608 — PACKAGE: 2000PCS / REEL



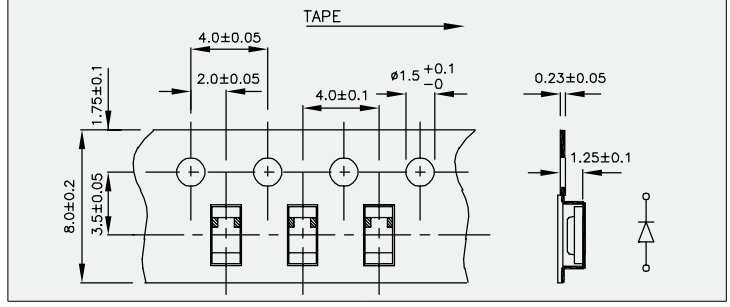
KPHCM-2012 — PACKAGE: 2000PCS / REEL



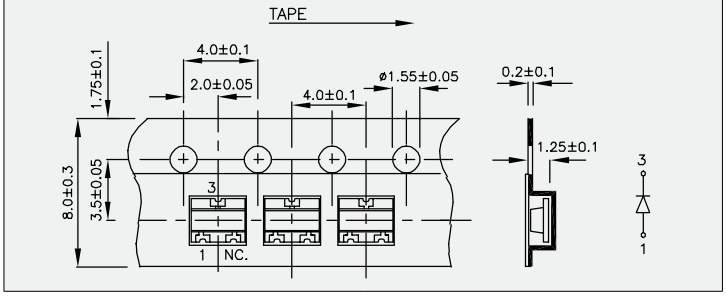
KPT-2012 — PACKAGE: 2000PCS / REEL



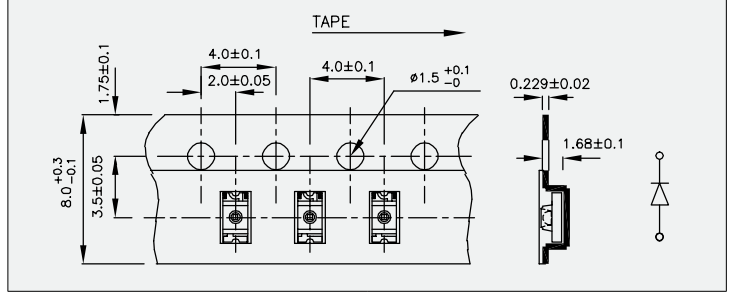
KP-2012 — PACKAGE: 2000PCS / REEL



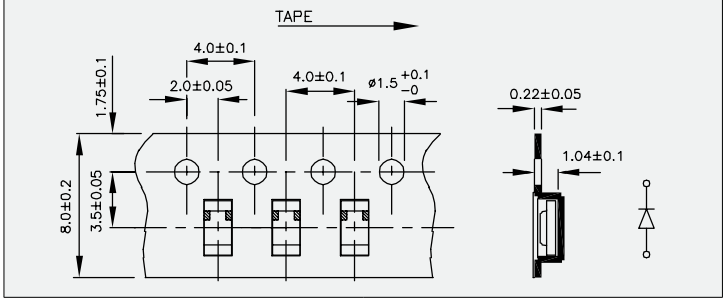
KP-23-F — PACKAGE: 2000PCS / REEL



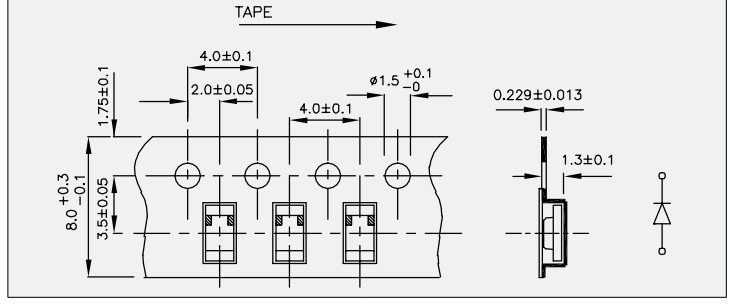
KPL-3015 — PACKAGE: 2000PCS / REEL



KPT-3216 — PACKAGE: 2000PCS / REEL



KP-3216 — PACKAGE: 2000PCS / REEL



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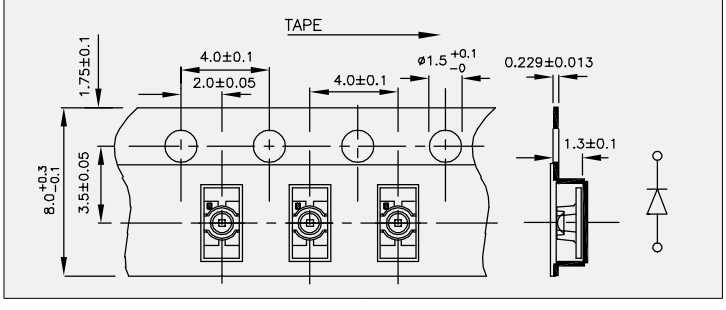
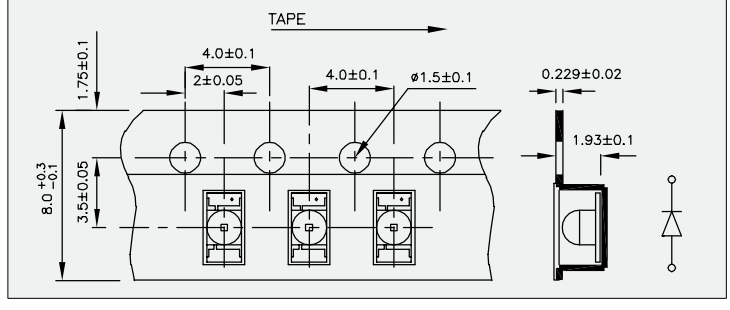


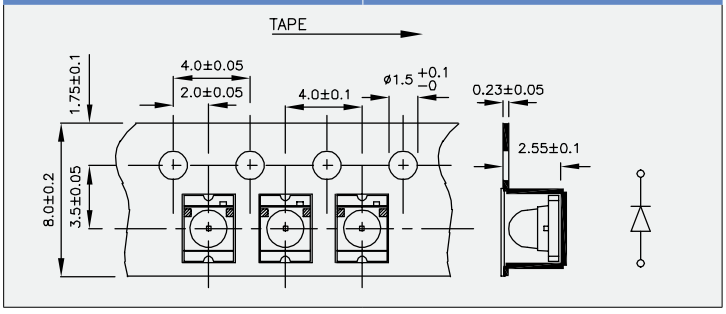
KPTD-3216 — PACKAGE: 2000PCS / REEL



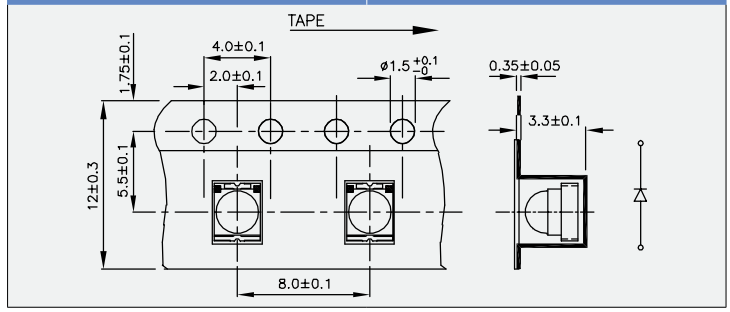
NOTE: 1. All dimensions are in millimeters.

SMD TAPE SPECIFICATIONS

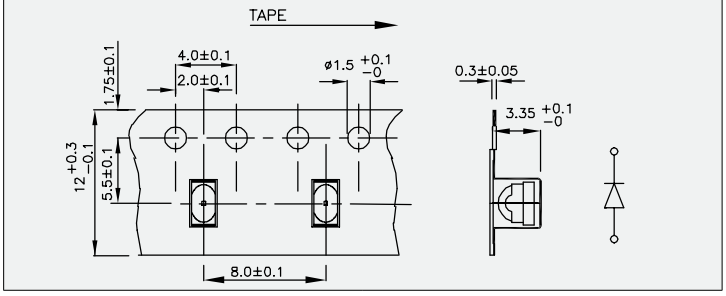
KPD-3224 — PACKAGE: 1500PCS / REEL



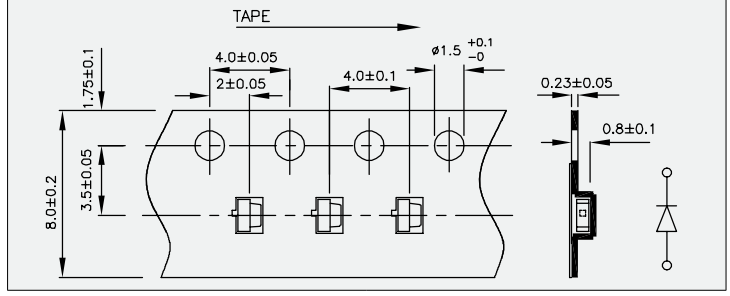
KPED-3528 — PACKAGE: 500PCS / REEL



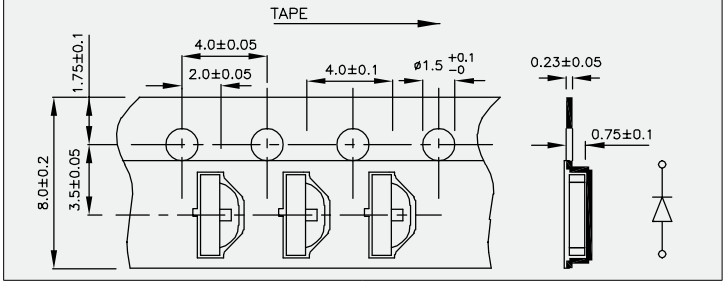
KPED-3820 — PACKAGE: 500PCS / REEL



KPA-1606 — PACKAGE: 2000PCS / REEL



KPA-2106 — PACKAGE: 2000PCS / REEL



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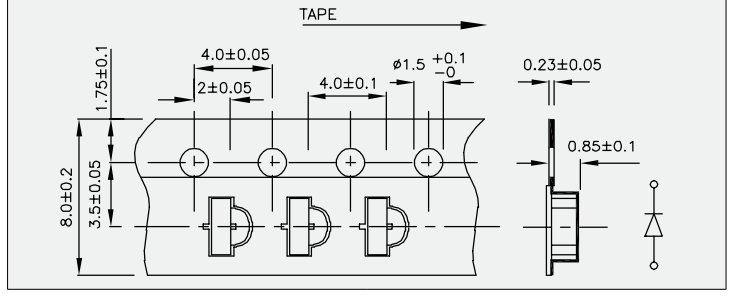
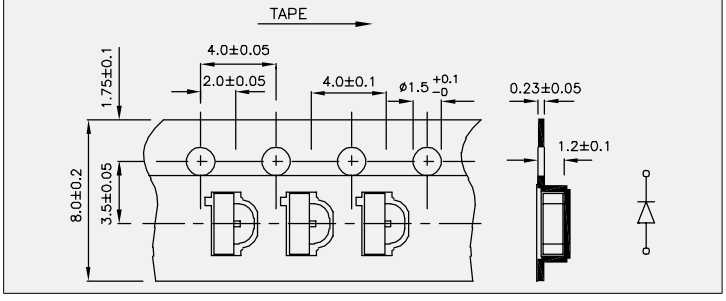
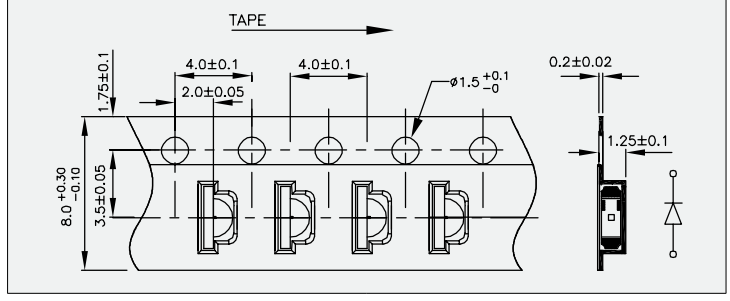


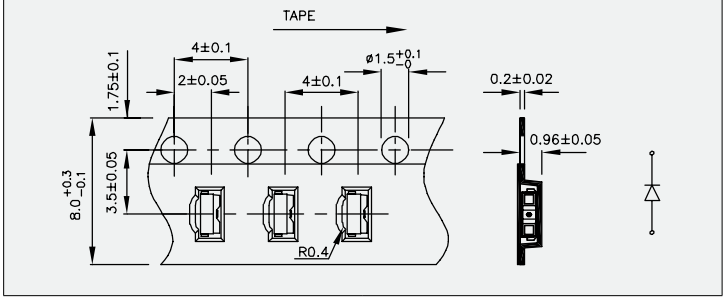
KPA-3010 — PACKAGE: 2000PCS / REEL



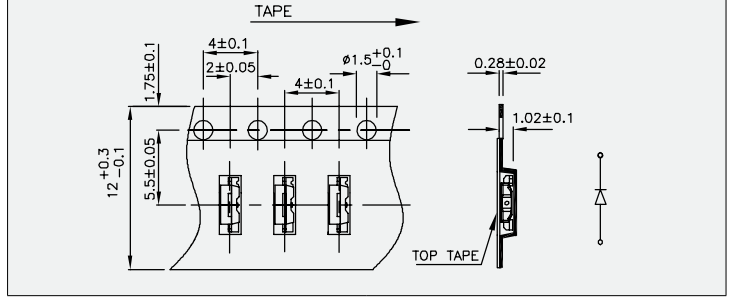
KPA-3210 — PACKAGE: 2000PCS / REEL



KA-2810A — PACKAGE: 2000PCS / REEL



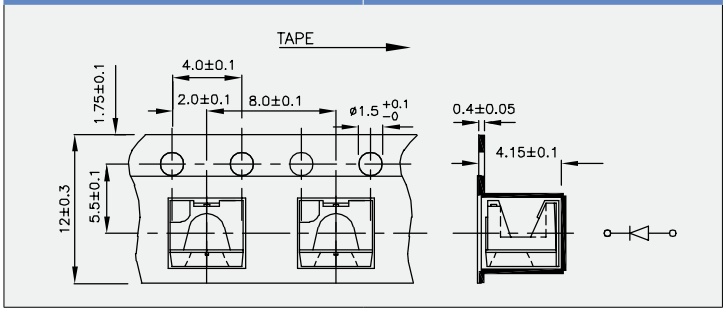
KA-4008 — PACKAGE: 2000PCS / REEL



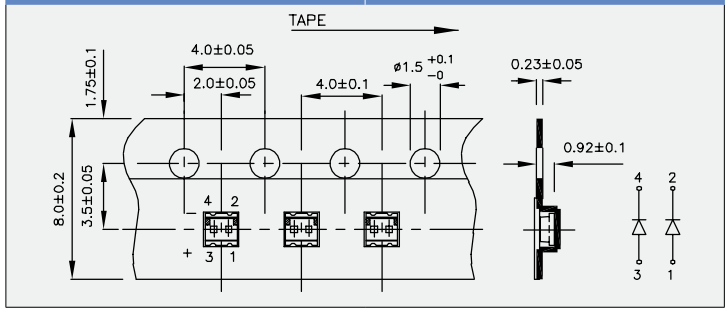
NOTE: 1. All dimensions are in millimeters.

SMD TAPE SPECIFICATIONS

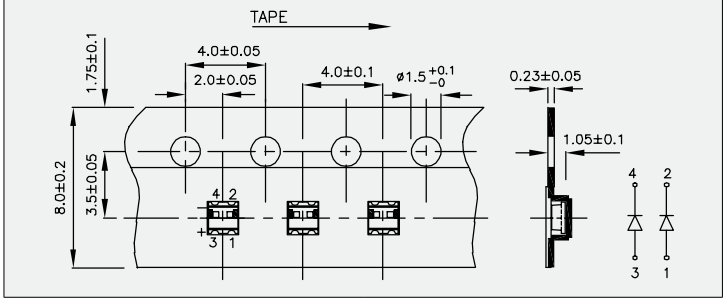
KA-4040 — PACKAGE: 500PCS / REEL



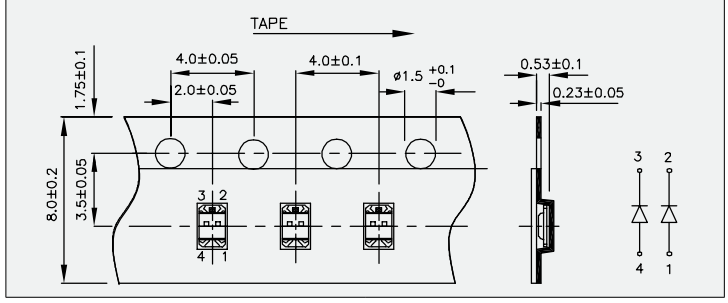
KPTB-1612 — PACKAGE: 2000PCS / REEL



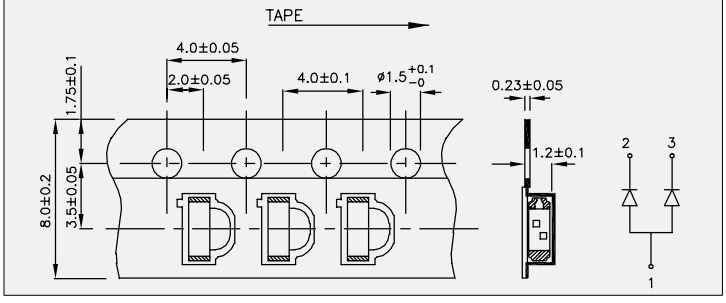
KPTB-1615 — PACKAGE: 2000PCS / REEL



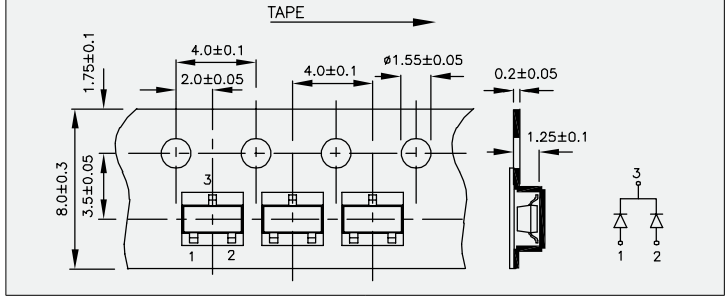
KPHBM-2012 — PACKAGE: 2000PCS / REEL



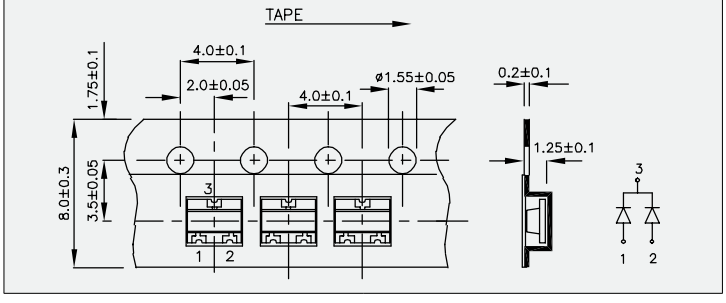
KPBA-3010 — PACKAGE: 2000PCS / REEL



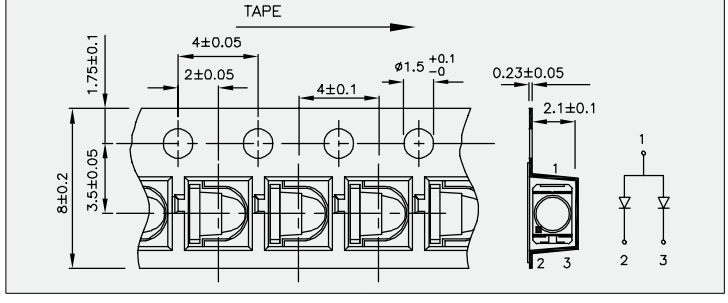
KM-23xxx — PACKAGE: 2000PCS / REEL



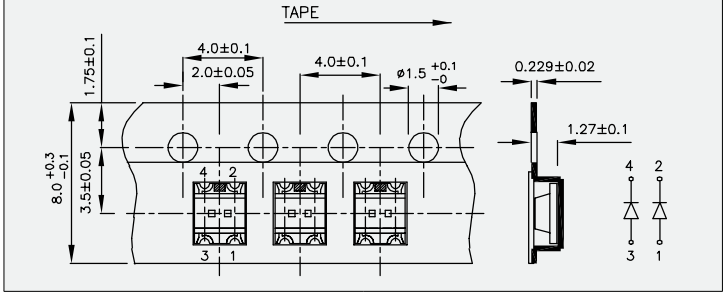
KP-23xxx — PACKAGE: 2000PCS / REEL



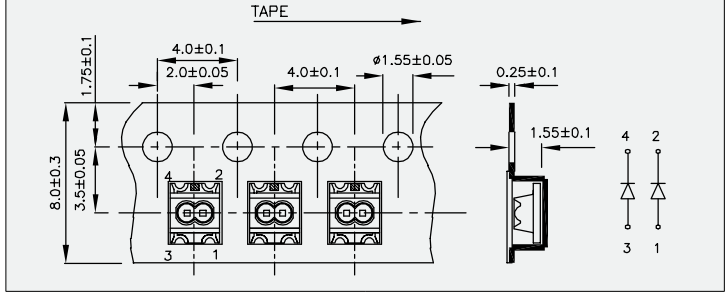
KPBDA-3020-PF — PACKAGE: 2000PCS / REEL



KPB-3025 — PACKAGE: 2000PCS / REEL



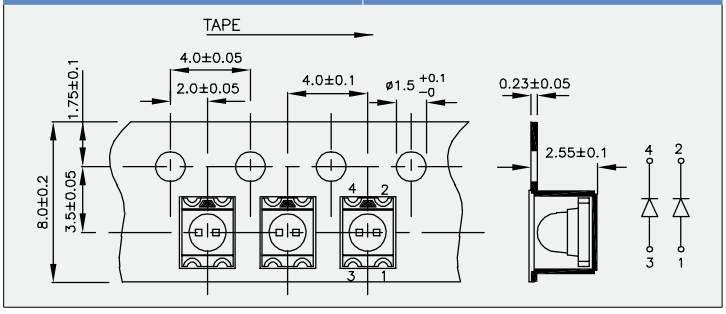
KPBL-3025 — PACKAGE:2000PCS / REEL



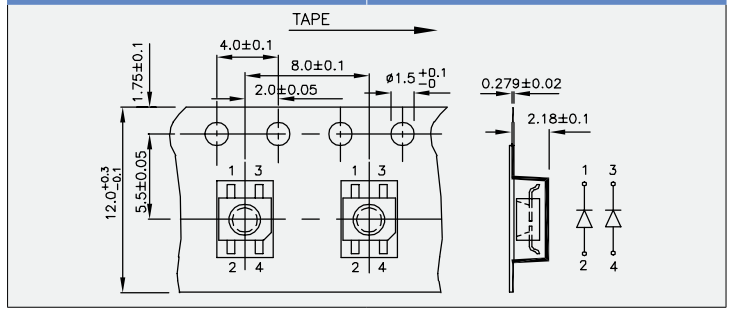
NOTE: 1. All dimensions are in millimeters.

SMD TAPE SPECIFICATIONS

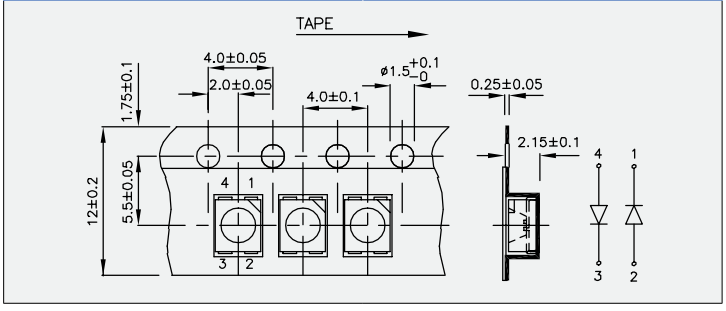
KPBD-3224 — PACKAGE: 1500PCS / REEL



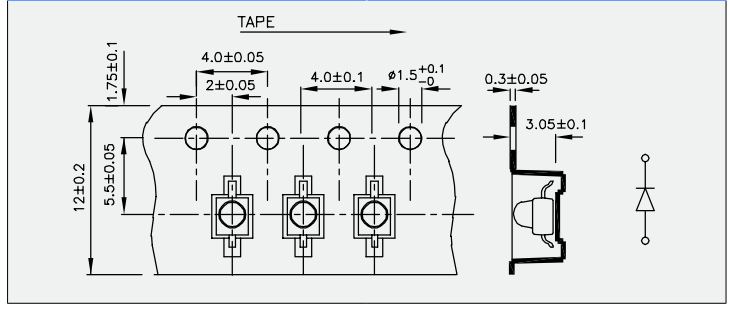
KA-2735 — PACKAGE: 1000PCS / REEL



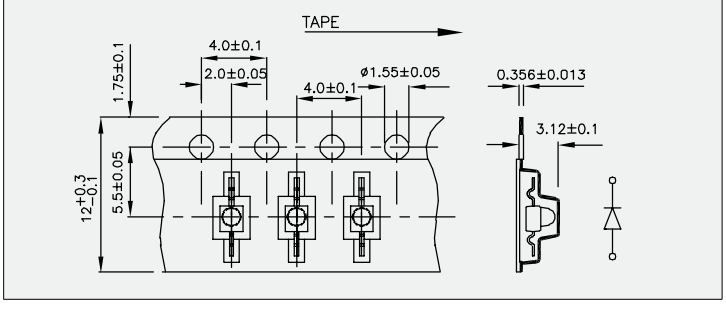
KAA-3528 — PACKAGE: 2000PCS / REEL



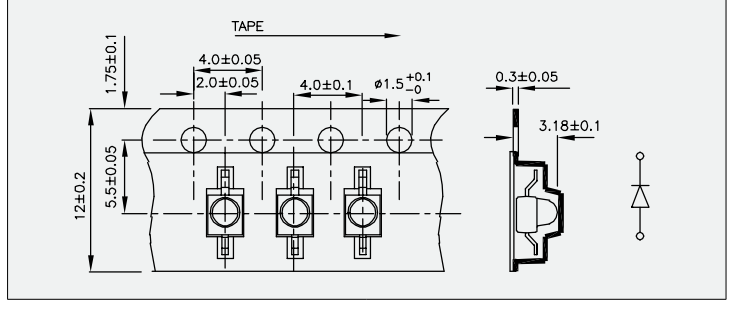
KM2520xxx03 — PACKAGE: 1000PCS / REEL



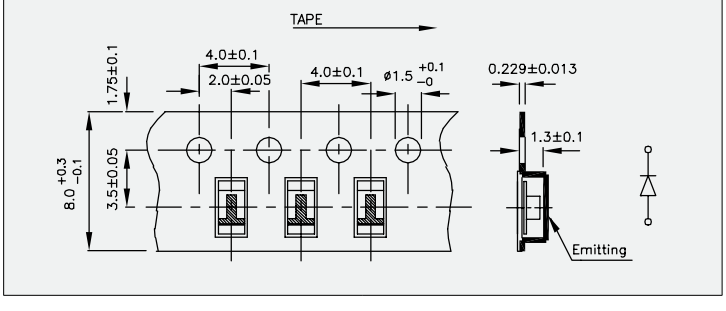
KM2520xxx08 — PACKAGE: 1000PCS / REEL



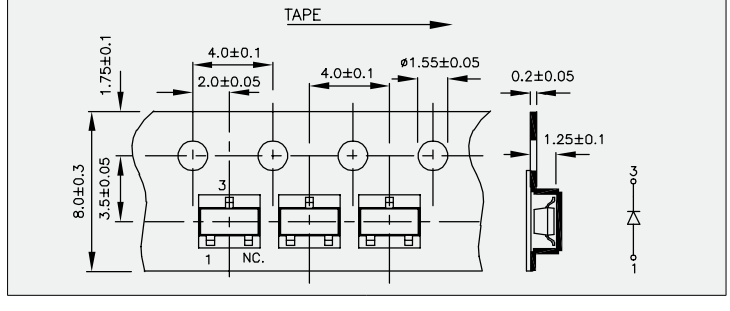
KM2520xxx09 — PACKAGE: 1000PCS / REEL



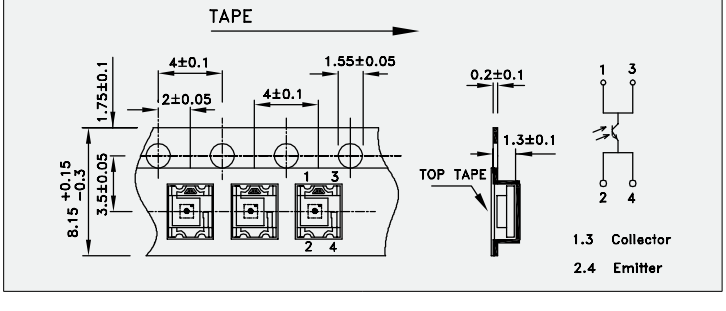
KPTR-3216 — PACKAGE: 2000PCS / REEL



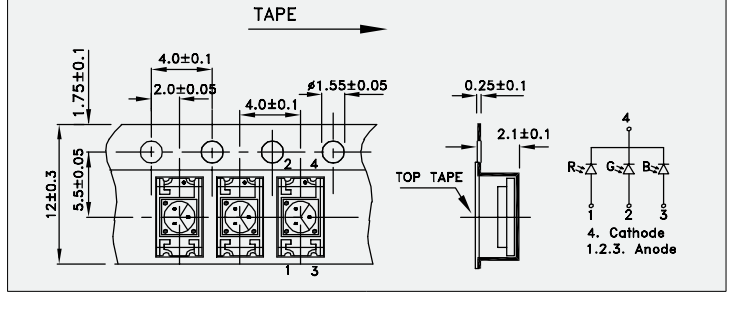
KM-23-F — PACKAGE: 2000PCS / REEL



KPS-3227 — PACKAGE: 2000PCS / REEL



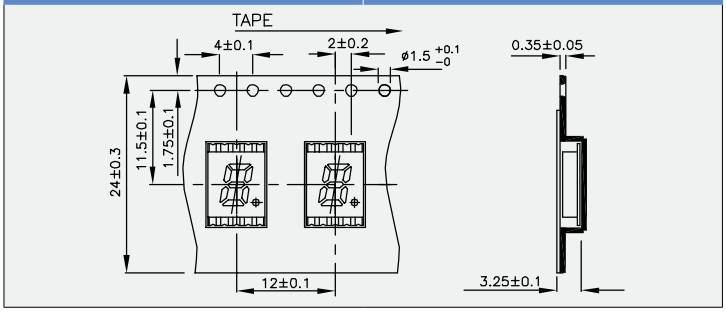
KPS-5130 — PACKAGE: 1500PCS / REEL



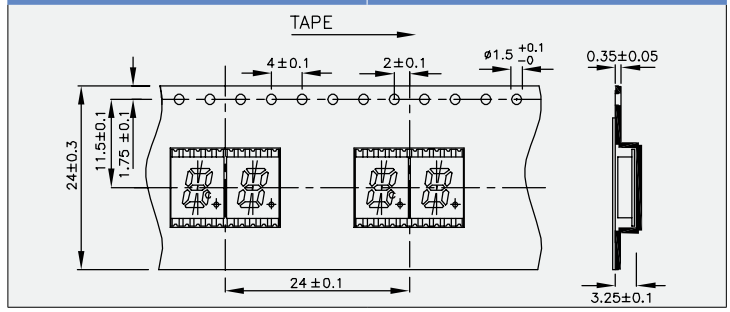
NOTE: 1. All dimensions are in millimeters.

SMD TAPE SPECIFICATIONS

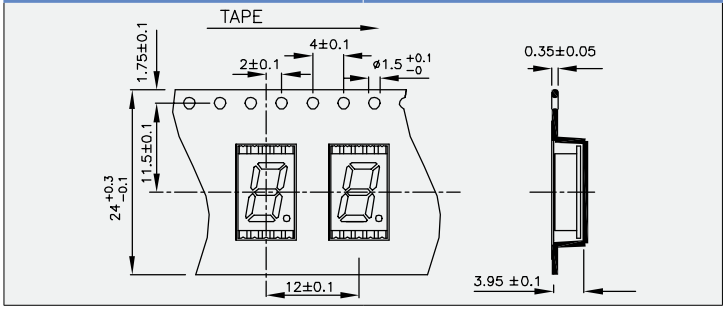
KCSX02 — PACKAGE: 650PCS / REEL



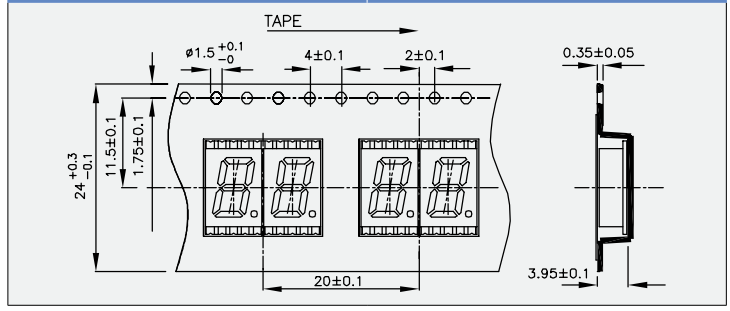
KCDX02 — PACKAGE: 300PCS / REEL



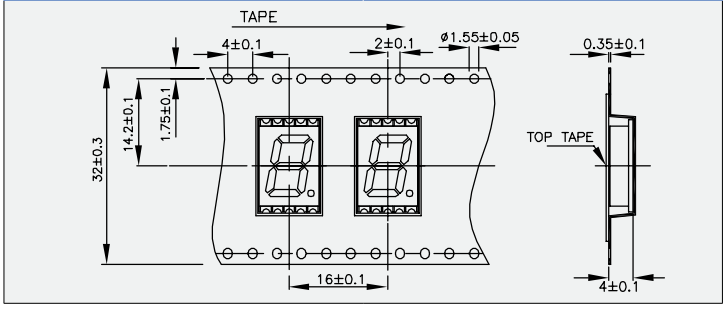
KCSX03 — PACKAGE: 550PCS / REEL



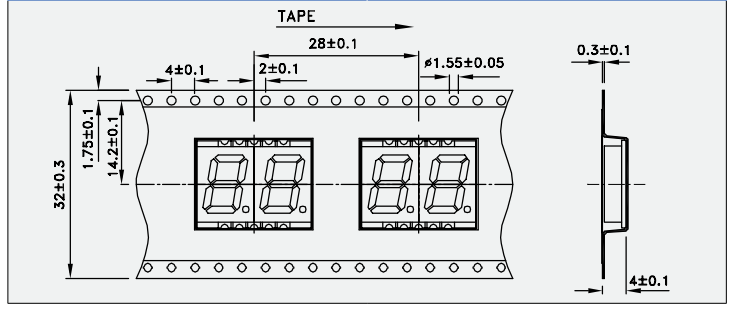
KCDX03 — PACKAGE: 300PCS / REEL



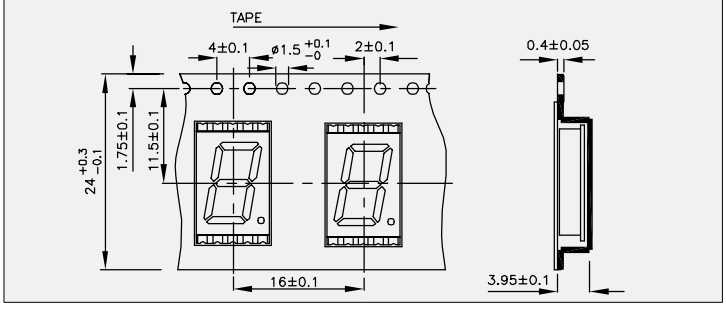
KCSX39 — PACKAGE: 400PCS / REEL



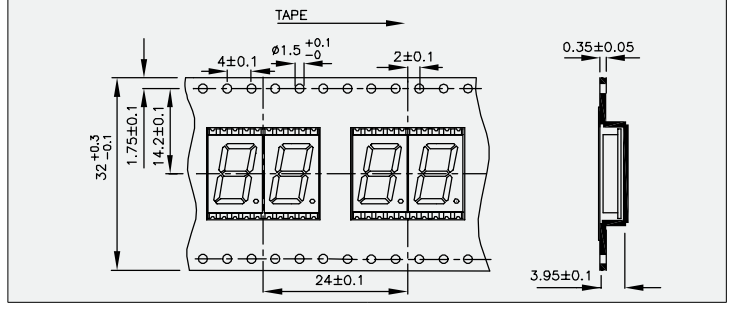
KCDX39 — PACKAGE: 250PCS / REEL



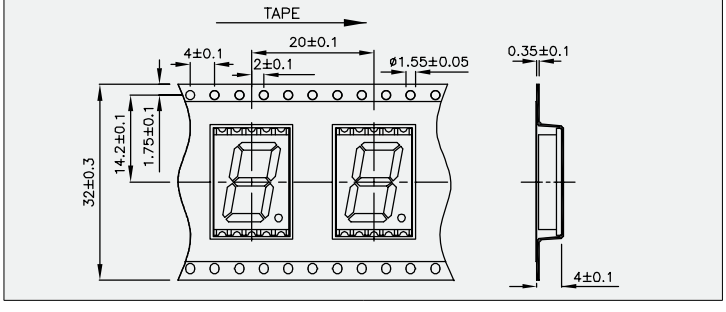
KCSX04 — PACKAGE: 400PCS / REEL



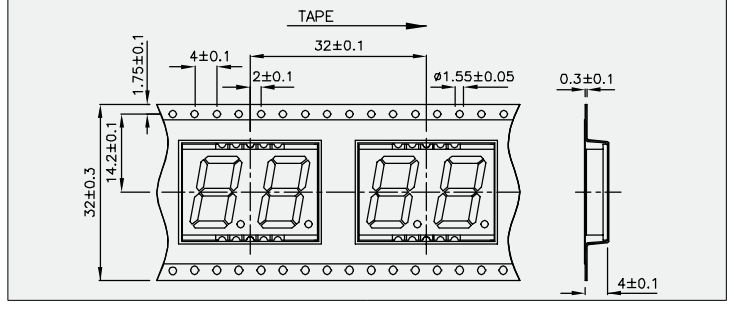
KCDX04 — PACKAGE: 250PCS / REEL



KCSX51 — PACKAGE: 400PCS / REEL



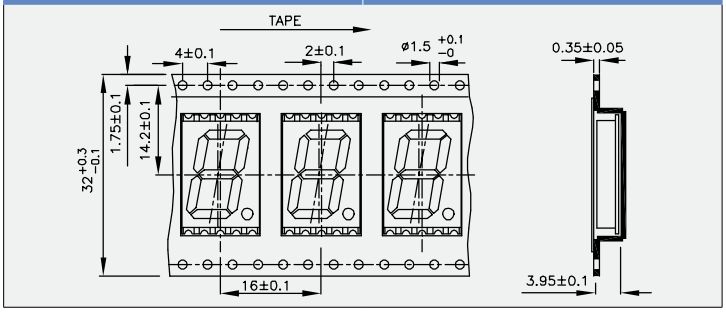
KCDX51 — PACKAGE: 200PCS / REEL



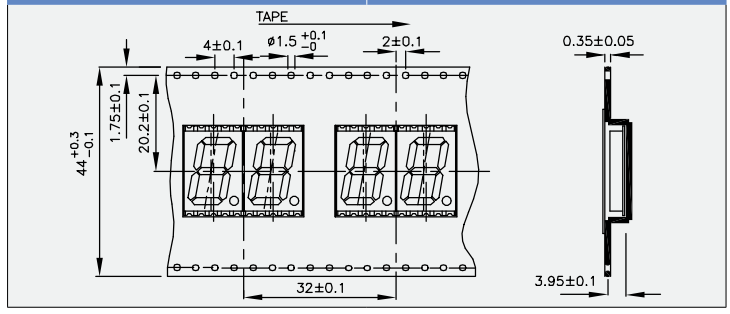
NOTE: 1. All dimensions are in millimeters.

SMD TAPE SPECIFICATIONS

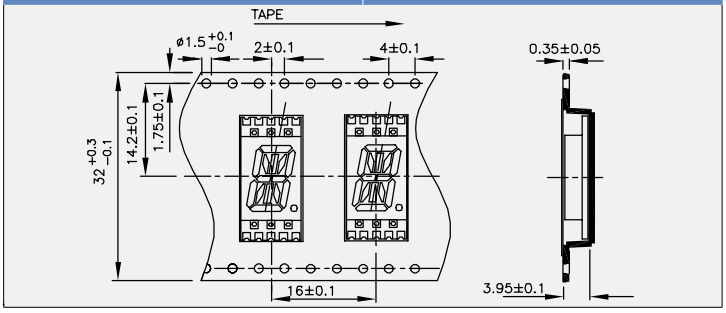
KCSX56 — PACKAGE: 400PCS / REEL



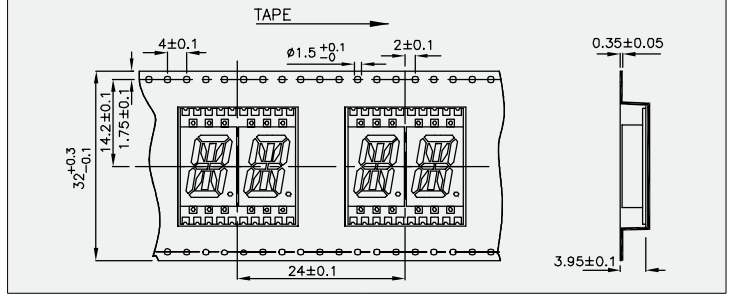
KCDX56 — PACKAGE: 200PCS / REEL



KCPSX04 — PACKAGE: 400PCS / REEL



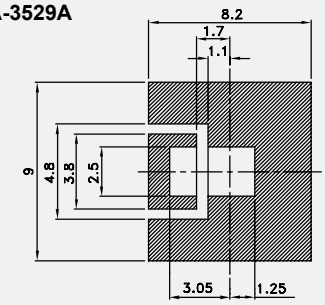
KCPDX04 — PACKAGE: 250PCS / REEL



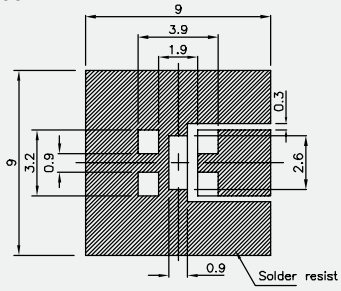
NOTE: 1. All dimensions are in millimeters.

RECOMMENDED SOLDERING PATTERN

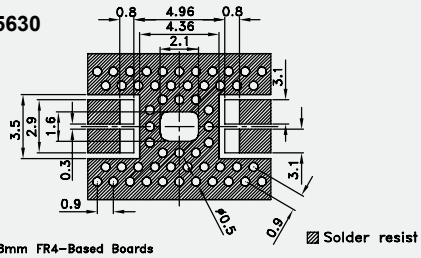
KA-3529A



KA-3535

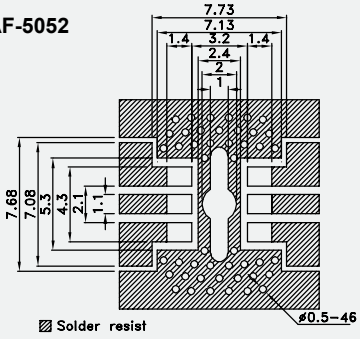


KA-5630

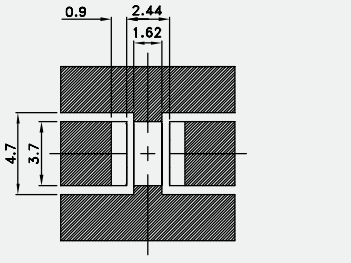


0.8mm FR4-Based Boards
For both the open via PTH and filled and capped via design, the finished hole diameter is 0.5mm. A smaller diameter will lead to an increase of thermal resistance. The recommended distance between two holes is 0.4 mm.This results in a minimal pitch of 0.9mm between the vias.

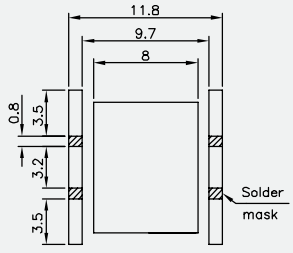
KAAF-5052



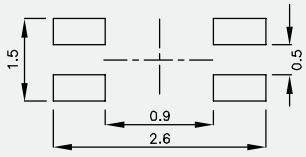
KTDS-3535



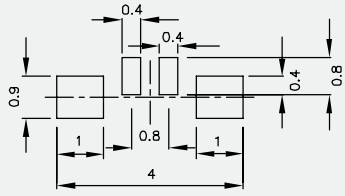
KT-1213



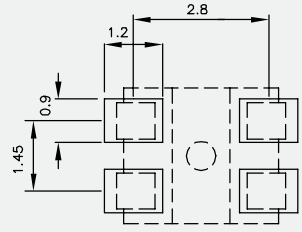
KPTF-1616RGBC-13



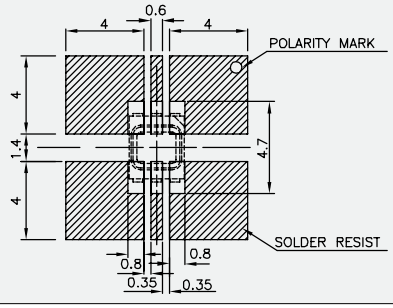
KPFA-3010RGBC-11



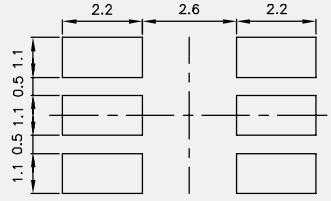
KAA-3528RGBS-11



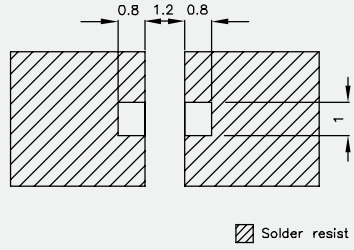
KAAF-3529RGBS-11-C3



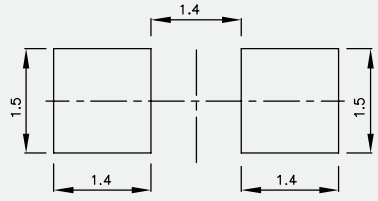
KAAF-5050RGBS-13



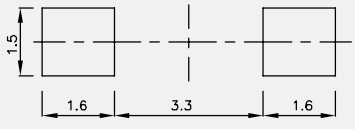
KA-2214



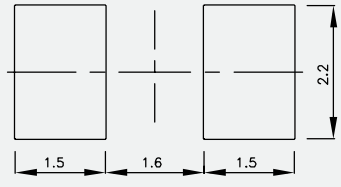
KA-3021



KA-3022-4.5SF



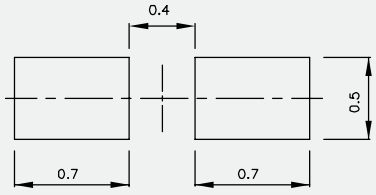
KA-3528



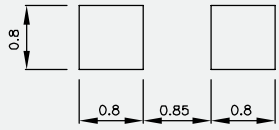
NOTES:
1. All dimensions are in millimeters.
2. Tolerance is ±0.1mm unless otherwise noted.

RECOMMENDED SOLDERING PATTERN

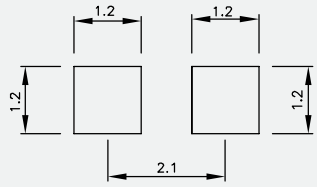
KPHHS-1005



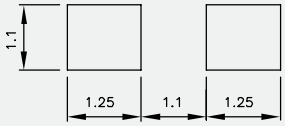
KPG-1608, KPH-1608, KP-1608, KPT-1608, KPTD-1608



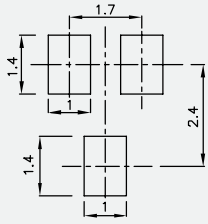
KPHCM-2012



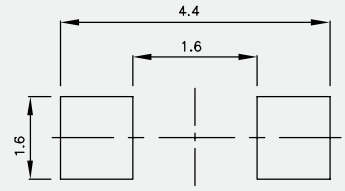
KPT-2012, KP-2012



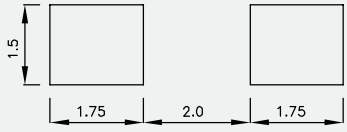
KP-23-F, KP-23xxx



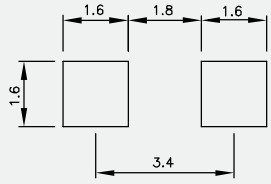
KPL-3015



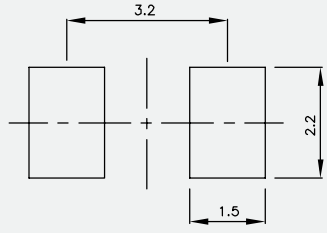
KPT-3216, KP-3216, KPTD-3216



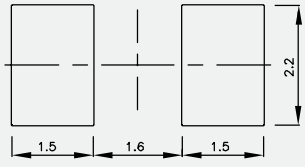
KPTL-3216



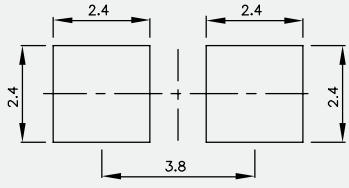
KPD-3224



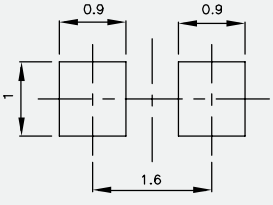
KPED-3528



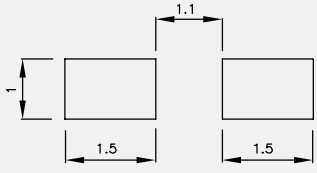
KPED-3820



KPA-1606

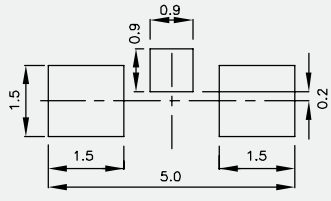


KPA-2106



KPJA-2107

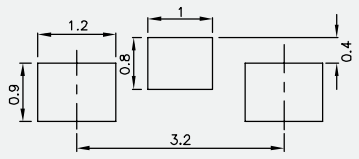
KPA-3010, KPBA-3010



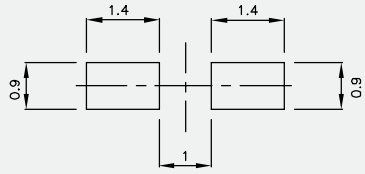
NOTES:
1. All dimensions are in millimeters.
2. Tolerance is ±0.1mm unless otherwise noted.

RECOMMENDED SOLDERING PATTERN

KPA-3210



KA-2810A



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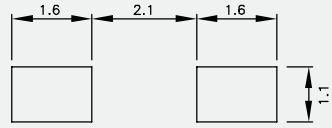

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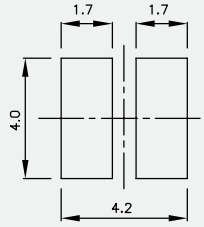

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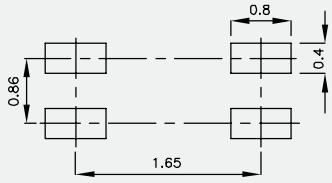

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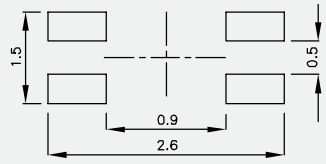
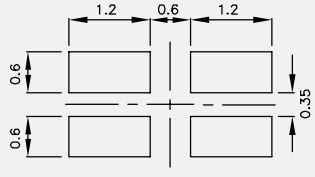
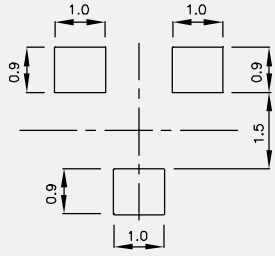


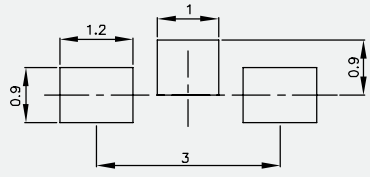
KPHBM-2012



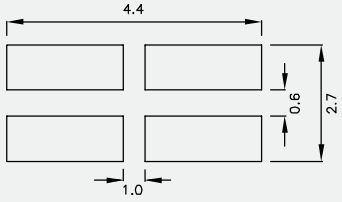
KM-23-F, KM-23xxx



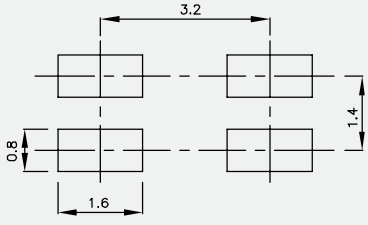
KPBDA-3020-PF



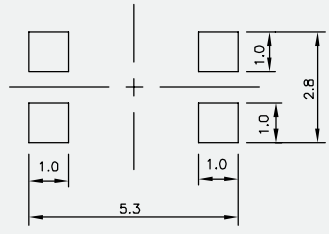
KPB-3025, KPBL-3025



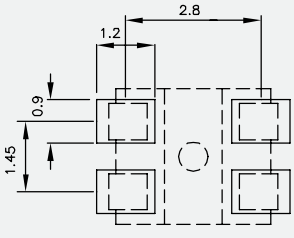
KPBD-3224



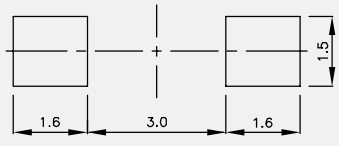
KA-2735



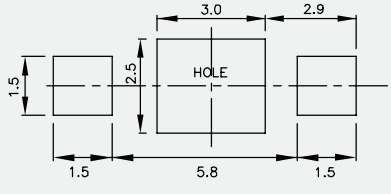
KAA-3528



KM2520xxx03



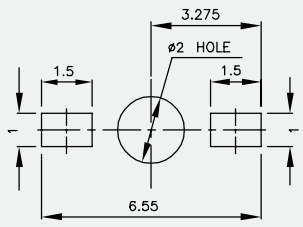
KM2520xxx08



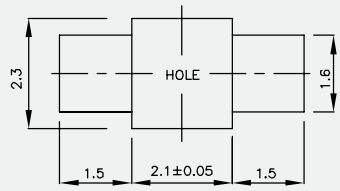
NOTES:
1. All dimensions are in millimeters.
2. Tolerance is ±0.1mm unless otherwise noted.

RECOMMENDED SOLDERING PATTERN

KM2520xxx09



KPTR-3216



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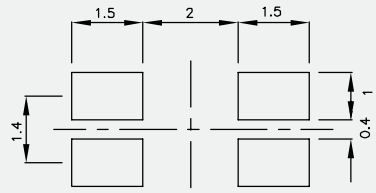
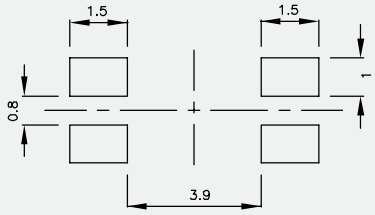
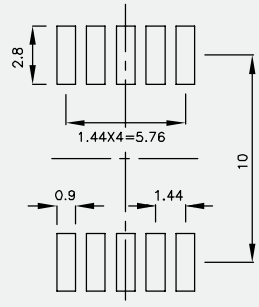


KPS-5130PD7C

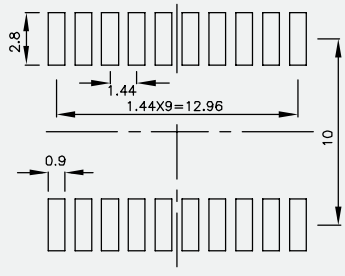


NOTES:
1. All dimensions are in millimeters.
2. Tolerance is ±0.1mm unless otherwise noted.

KCSX02



KCDX02



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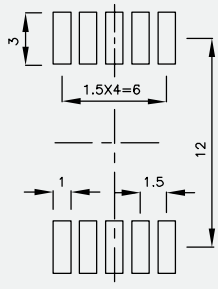

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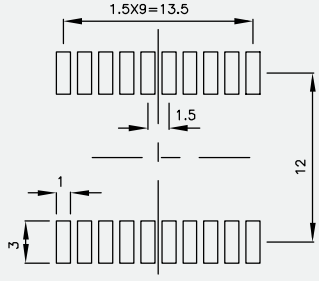

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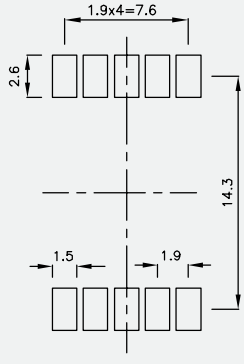

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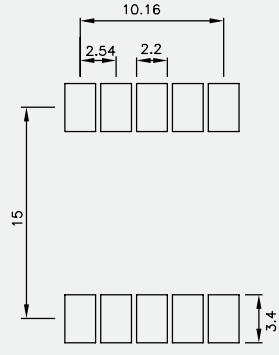
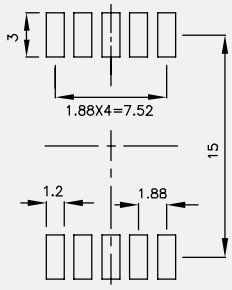


NOTES:
1. All dimensions are in millimeters.
2. Tolerance is ±0.15mm unless otherwise noted.

RECOMMENDED SOLDERING PATTERN

KCSX04



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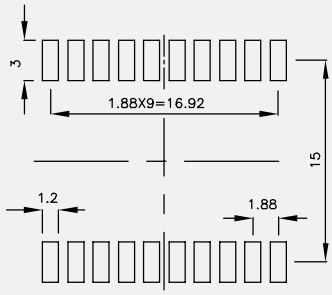

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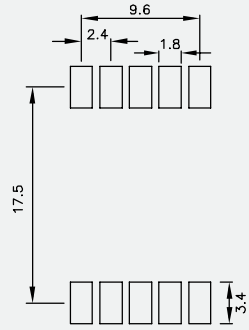

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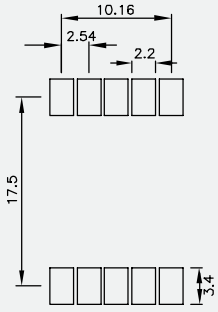

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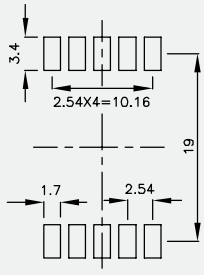

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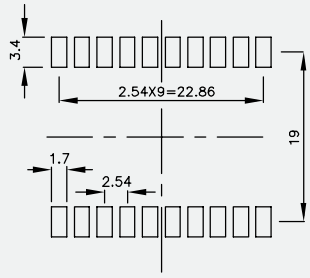
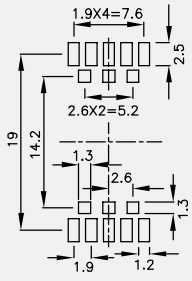


KCPSX04



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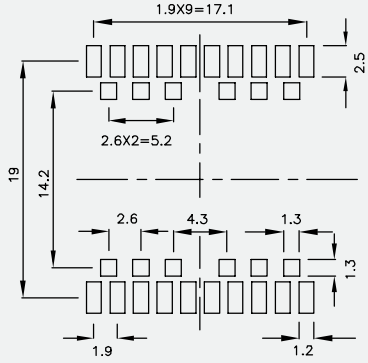


NOTES:
1. All dimensions are in millimeters.
2. Tolerance is ±0.15mm unless otherwise noted.

TECHNICAL DATA

Absolute maximum ratings (T_A=25°C)		E,I Hi.Eff.Red Orange (GaAsP/GaP)	H Bright Red (GaP)	SR Super Bright Red (GaAlAs)	SURK Hyper Red (AlGaInP)	SURK-T Hyper Red (AlGaInP)	SUR-E Hyper Red (AlGaInP)	Unit
		●	●	●	●	●	●	
Reverse voltage	V_R	5	5	5	5	5	5	V
Forward current	I_F	30	25	30	30	30	30	mA
Forward current (Peak) 1/10 Duty Cycle, 0.1ms Pulse Width	i_{FS}	160	130	155	185	150	200	mA
Power dissipation	P_D	75	62.5	75	75	75	75	mW
LED LAMPS:								
Operating temperature	T_A	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
Storage temperature	T_{STG}	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
LED DISPLAYS:								
Operating temperature	T_A	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
Storage temperature	T_{STG}	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C

Operating Characteristics		E,I Hi.Eff.Red Orange (GaAsP/GaP)	H Bright Red (GaP)	SR Super Bright Red (GaAlAs)	SURK Hyper Red (AlGaInP)	SURK-T Hyper Red (AlGaInP)	SUR-E Hyper Red (AlGaInP)	Unit
		●	●	●	●	●	●	
Forward voltage (typ.)								
I_F=20mA		2.0	2.25	1.85	1.95	2.0	1.9	
I_F=10mA	V_F	1.9	2.05	1.8	1.85	1.85	1.8	V
I_F=2mA		1.7	1.85	1.65	1.75	1.75	1.7	
Forward voltage (max.) I_F=20mA, 10mA, 2mA	V_F	2.5	2.5	2.5	2.5	2.5	2.5	V
Reverse current V_R=5V	I_R	10	10	10	10	10	10	uA
Peak Emission Wavelength I_F=20mA, 10mA, 2mA	λp	627	700	655	645	645	645	nm
Dominant Wavelength I_F=20mA, 10mA, 2mA	λD	617	635	640	630	630	630	nm
Spectral line half-width I_F=20mA, 10mA, 2mA	Δλ1/2	45	45	20	28	20	25	nm
Capacitance V_F=0V,f=1MHZ	C	15	40	45	35	35	45	pF

TECHNICAL DATA

Absolute maximum ratings (T_A=25°C)		SUR-G Hyper Red (AlGaInP)	N Pure Orange (GaAsP/GaP)	SEK Super Bright Orange (AlGaInP)	SEK-T Super Bright Orange (AlGaInP)	SE-H Hyper Orange (AlGaInP)	SE-J3 Hyper Red (AlGaInP)	Unit
		●	●	●	●	●	●	
Reverse voltage	V_R	5	5	5	5	5	5	V
Forward current	I_F	30	25	30	30	30	30	mA
Forward current (Peak) 1/10 Duty Cycle, 0.1ms Pulse Width	i_{FS}	150	145	195	150	150	150	mA
Power dissipation	P_D	75	62.5	75	75	84	84	mW
LED LAMPS:								
Operating temperature	T_A	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
Storage temperature	T_{STG}	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
LED DISPLAYS:								
Operating temperature	T_A	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
Storage temperature	T_{STG}	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C

Operating Characteristics		SUR-G Hyper Red (AlGaInP)	N Pure Orange (GaAsP/GaP)	SEK Super Bright Orange (AlGaInP)	SEK-T Super Bright Orange (AlGaInP)	SE-H Hyper Orange (AlGaInP)	SE-J3 Hyper Red (AlGaInP)	Unit
		●	●	●	●	●	●	
Forward voltage (typ.)								
I_F=20mA		1.9	2.05	2.1	2.05	2.2	2.2	
I_F=10mA	V_F	1.85	1.95	2.0	1.95	2.05	2.0	V
I_F=2mA		1.75	1.85	1.85	1.8	1.85	1.8	
Forward voltage (max.) I_F=20mA, 10mA, 2mA	V_F	2.5	2.5	2.5	2.5	2.8	2.5	V
Reverse current V_R=5V	I_R	10	10	10	10	10	10	uA
Peak Emission Wavelength I_F=20mA, 10mA, 2mA	λp	645	607	610	610	635	640	nm
Dominant Wavelength I_F=20mA, 10mA, 2mA	λD	630	602	601	601	625	625	nm
Spectral line half-width I_F=20mA, 10mA, 2mA	Δλ1/2	22	35	29	17	25	25	nm
Capacitance V_F=0V,f=1MHZ	C	45	15	15	15	27	27	pF

TECHNICAL DATA

Absolute maximum ratings (T_A=25°C)		G,SG Green, Super Bright Green (GaP)	PG Pure Green (GaP)	CGK Green (AlGaInP)	CGK-T Green (AlGaInP)	ZG Green (InGaN)	ZG-E Green (InGaN)	Unit
		●	●	●	●	●	●	
Reverse voltage	V_R	5	5	5	5	5	5	V
Forward current	I_F	25	25	30	30	25	30	mA
Forward current (Peak) 1/10 Duty Cycle, 0.1ms Pulse Width	i_{FS}	140	135	150	150	150	100	mA
Power dissipation	P_D	62.5	62.5	75	78	102.5	120	mW
LED LAMPS:								
Operating temperature	T_A	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
Storage temperature	T_{STG}	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
LED DISPLAYS:								
Operating temperature	T_A	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
Storage temperature	T_{STG}	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C

Operating Characteristics		G,SG Green, Super Bright Green (GaP)	PG Pure Green (GaP)	CGK Green (AlGaInP)	CGK-T Green (AlGaInP)	ZG Green (InGaN)	ZG-E Green (InGaN)	Unit
		●	●	●	●	●	●	
Forward voltage (typ.)								
I_F=20mA		2.2	2.25	2.1	2.1	3.3	3.2	
I_F=10mA	V_F	2.0	2.1	2.0	1.95	3.0	3.05	V
I_F=2mA		1.9	1.9	1.9	1.8	2.65	2.8	
Forward voltage (max.) I_F=20mA, 10mA, 2mA	V_F	2.5	2.5	2.5	2.6	4.1	4.0	V
Reverse current V_R=5V	I_R	10	10	10	10	50	50	uA
Peak Emission Wavelength I_F=20mA, 10mA, 2mA	λp	565	557	574	574	515	520	nm
Dominant Wavelength I_F=20mA, 10mA, 2mA	λD	568	557	570	570	525	525	nm
Spectral line half-width I_F=20mA, 10mA, 2mA	Δλ1/2	30	30	20	15	30	35	nm
Capacitance V_F=0V,f=1MHZ	C	15	45	15	15	45	100	pF

TECHNICAL DATA

Absolute maximum ratings (T_A=25°C)		ZG-G Green (InGaN)	Y Yellow (GaAsP/GaP)	SYK Super Bright Yellow (AlGaInP)	SYK-T Super Bright Yellow (AlGaInP)	SY-H Super Bright Yellow (AlGaInP)	SY-J3 Super Bright Yellow (AlGaInP)	Unit
		●	●	●	●	●	●	
Reverse voltage	V_R	5	5	5	5	5	5	V
Forward current	I_F	30	30	30	30	30	30	mA
Forward current (Peak) 1/10 Duty Cycle, 0.1ms Pulse Width	i_{FS}	100	140	175	150	140	140	mA
Power dissipation	P_D	120	75	75	75	84	75	mW
LED LAMPS:								
Operating temperature	T_A	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
Storage temperature	T_{STG}	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
LED DISPLAYS:								
Operating temperature	T_A	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
Storage temperature	T_{STG}	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C

Operating Characteristics		ZG-G Green (InGaN)	Y Yellow (GaAsP/GaP)	SYK Super Bright Yellow (AlGaInP)	SYK-T Super Bright Yellow (AlGaInP)	SY-H Super Bright Yellow (AlGaInP)	SY-J3 Super Bright Yellow (AlGaInP)	Unit
Forward voltage (typ.)		●	●	●	●	●	●	
I_F=20mA		3.2	2.1	2.0	2.05	2.3	2.0	
I_F=10mA	V_F	3.05	1.95	1.95	1.95	2.2	1.95	V
I_F=2mA		2.8	1.85	1.85	1.8	2	1.85	
Forward voltage (max.) I_F=20mA, 10mA, 2mA	V_F	4.0	2.5	2.5	2.5	2.8	2.5	V
Reverse current V_R=5V	I_R	50	10	10	10	10	10	uA
Peak Emission Wavelength I_F=20mA, 10mA, 2mA	λp	520	590	590	590	590	590	nm
Dominant Wavelength I_F=20mA, 10mA, 2mA	λD	525	588	590	590	589	590	nm
Spectral line half-width I_F=20mA, 10mA, 2mA	Δλ1/2	35	35	20	15	20	20	nm
Capacitance V_F=0V,f=1MHZ	C	100	20	20	25	45	45	pF

TECHNICAL DATA

Absolute maximum ratings (T_A=25°C)		MB Blue (GaN)	PB-A Blue (InGaN)	QB-D Blue (InGaN)	QB-F Blue (InGaN)	QB-G Blue (InGaN)	VB-D Blue (InGaN)	Unit
		●	●	●	●	●	●	
Reverse voltage	V_R	5	5	5	5	5	5	V
Forward current	I_F	30	30	30	30	30	30	mA
Forward current (Peak) 1/10 Duty Cycle, 0.1ms Pulse Width	i_{FS}	150	100	150	150	150	100	mA
Power dissipation	P_D	135	120	120	120	120	120	mW
LED LAMPS:								
Operating temperature	T_A	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
Storage temperature	T_{STG}	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
LED DISPLAYS:								
Operating temperature	T_A	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
Storage temperature	T_{STG}	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C

Operating Characteristics		MB Blue (GaN)	PB-A Blue (InGaN)	QB-D Blue (InGaN)	QB-F Blue (InGaN)	QB-G Blue (InGaN)	VB-D Blue (InGaN)	Unit
Forward voltage (typ.)		●	●	●	●	●	●	
I_F=20mA		3.8	3.2	3.3	3.3	3.3	3.3	
I_F=10mA	V_F	3.6	3.05	3.0	3.0	3.0	3.0	V
I_F=2mA		3.4	2.8	2.65	2.65	2.65	2.65	
Forward voltage (max.) I_F=20mA, 10mA, 2mA	V_F	4.5	4.0	4.0	4.0	4.0	4.0	V
Reverse current V_R=5V	I_R	10	10	50	50	50	50	uA
Peak Emission Wavelength I_F=20mA, 10mA, 2mA	λp	430	468	460	460	461	465	nm
Dominant Wavelength I_F=20mA, 10mA, 2mA	λD	466	465	465	465	465	470	nm
Spectral line half-width I_F=20mA, 10mA, 2mA	Δλ1/2	60	21	25	25	25	22	nm
Capacitance V_F=0V,f=1MHZ	C	100	100	100	100	100	100	pF

TECHNICAL DATA 5V/14V WITH INTERNAL RESISTANCE

Absolute maximum ratings (T_A=25°C)		E,I Hi.Eff.Red (GaAsP/GaP)	SR Super Bright Red (GaAlAs)	G Green (GaP)	Y Yellow (GaAsP/GaP)	Unit
		●	●	●	●	
Reverse voltage	V_R	5	5	5	5	V
Forward voltage (Max.) for 5V	V_F	6	6	6	6	V
Forward voltage (Max.) for 14V	V_F	16	16	16	16	V
Power dissipation for 5V	P_D	85	85	85	85	mW
Power dissipation for 14V	P_D	160	160	160	160	mW
LED LAMPS:						
Operating temperature	T_A	- 40~+70	- 40~+70	- 40~+70	- 40~+70	°C
Storage temperature	T_{STG}	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
LED DISPLAYS:						
Operating temperature	T_A	- 40~+70	- 40~+70	- 40~+70	- 40~+70	°C
Storage temperature	T_{STG}	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C

Operating Characteristics		E,I Hi.Eff.Red (GaAsP/GaP)	SR Super Bright Red (GaAlAs)	G Green (GaP)	Y Yellow (GaAsP/GaP)	Unit
		●	●	●	●	
Forward current (typ.) V_F=5V	I_F	13	13	11.5	13	mA
Forward current (typ.) V_F=14V	I_F	10.5	10.5	10.5	10.5	mA
Forward current (max.) V_F=5V	I_F	17.5	17.5	17.5	17.5	mA
Forward current (max.) V_F=14V	I_F	13.5	13.5	13.5	13.5	mA
Reverse current V_R=5V	I_R	10	10	10	10	uA
Peak Emission Wavelength V_F=5V,14V	λp	627	655	565	590	nm
Dominant Wavelength V_F=5V,14V	λD	617	640	568	588	nm
Spectral line half-width V_F=5V,14V	$\Delta\lambda 1/2$	45	20	30	35	nm

TECHNICAL DATA FOR BLINKING LED LAMPS

Absolute maximum ratings (T_A=25°C)		E,I Hi.Eff.Red (GaAsP/GaP)	H Bright Red (GaP)	SR Super Bright Red (GaAlAs)	G Green (GaP)	Y Yellow (GaAsP/GaP)	Unit
		●	●	●	●	●	
Reverse voltage	V_R	0.5	0.5	0.5	0.5	0.5	V
Forward voltage (max.)	V_F	14	14	14	14	14	V
Total Power dissipation	P_D	310	310	310	310	310	mW
Operating temperature	T_A	- 40~+70	- 40~+70	- 40~+70	- 40~+70	- 40~+70	°C
Storage temperature	T_{STG}	- 40~+85	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C

Operating Characteristics		E,I Hi.Eff.Red (GaAsP/GaP)	H Bright Red (GaP)	SR Super Bright Red (GaAlAs)	G Green (GaP)	Y Yellow (GaAsP/GaP)	Unit
		●	●	●	●	●	
Forward current (min.) V_F=3.5V	I_F	8	8	8	8	8	mA
Forward current (typ.) V_F=5V	I_F	22	22	22	22	22	mA
Supply current V_F=3.5V ~ 14V	I_{SON}	8 ~ 44	8 ~ 44	8 ~ 44	8 ~ 44	8 ~ 44	mA
Blink frequency V_F=3.5V ~ 14V	f	3 ~ 1.5	3 ~ 1.5	3 ~ 1.5	3 ~ 1.5	3 ~ 1.5	Hz
Peak Emission Wavelength	λp	627	700	655	565	590	nm
Dominant Wavelength	λD	617	635	640	568	588	nm
Spectral line half-width	Δλ1/2	45	45	20	30	35	nm

TECHNICAL DATA FOR INFRARED

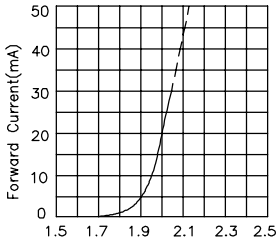
Absolute maximum ratings (T_A=25°C)		F3 (GaAs)	SF4 (GaAlAs)	SF6 (GaAlAs)	SF7 (GaAlAs)	Unit
		●	●	●	●	
Reverse voltage	V_R	5	5	5	5	V
Forward current	I_F	50	50	50	50	mA
Forward current (Peak) 1/100 Duty Cycle, 10μs Pulse Width	i_{FS}	1.2	1.2	1	1	A
Power dissipation	P_D	80	80	80	80	mW
LED LAMPS:						
Operating temperature	T_A	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
Storage temperature	T_{STG}	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
LED DISPLAYS:						
Operating temperature	T_A	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C
Storage temperature	T_{STG}	- 40~+85	- 40~+85	- 40~+85	- 40~+85	°C

Operating Characteristics		F3 (GaAs)	SF4 (GaAlAs)	SF6 (GaAlAs)	SF7 (GaAlAs)	Unit
		●	●	●	●	
Forward voltage (typ.) I_F=20mA	V_F	1.2	1.3	1.35	1.4	V
Forward voltage (max.) I_F=20mA	V_F	1.6	1.6	1.6	1.6	V
Reverse current V_R=5V	I_R	10	10	10	10	uA
Peak Emission Wavelength I_F=20mA	λp	940	880	860	850	nm
Spectral line half-width I_F=20mA	Δλ1/2	50	50	50	50	nm
Capacitance VF=0V,f=1MHZ	C	90	90	30	30	pF

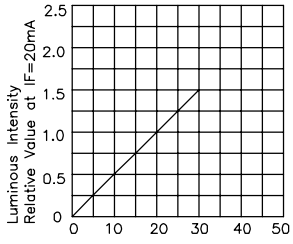
TECHNICAL DATA

High Efficiency Red, Orange

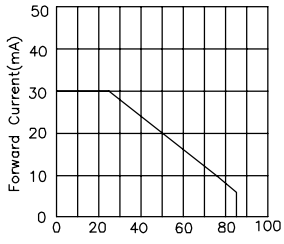
E,I : GaAsP/GaP



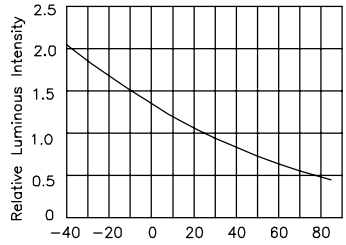
Forward Voltage(V)
FORWARD CURRENT Vs.
FORWARD VOLTAGE



IF—Forward Current (mA)
LUMINOUS INTENSITY Vs.
FORWARD CURRENT



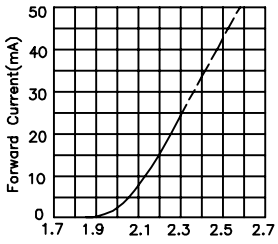
Ambient Temperature TA (°C)
FORWARD CURRENT
DERATING CURVE



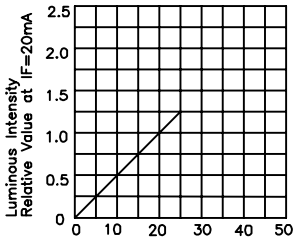
Ambient Temperature TA (°C)
LUMINOUS INTENSITY Vs.
AMBIENT TEMPERATURE

Bright Red

H : GaP

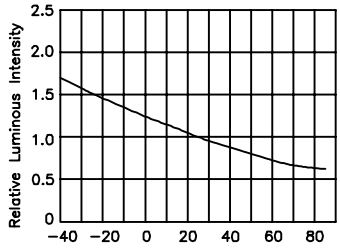


Forward Voltage(V)
FORWARD CURRENT Vs.
FORWARD VOLTAGE



IF—Forward Current (mA)
LUMINOUS INTENSITY Vs.
FORWARD CURRENT

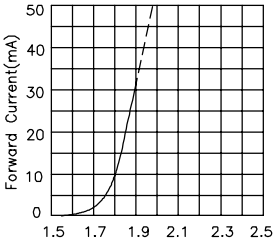
Ambient Temperature TA (°C)
FORWARD CURRENT
DERATING CURVE



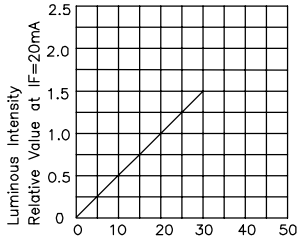
Ambient Temperature TA (°C)
LUMINOUS INTENSITY Vs.
AMBIENT TEMPERATURE

Super Bright Red

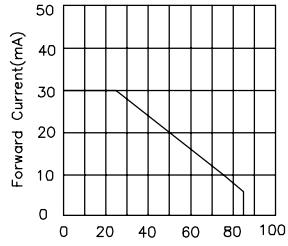
SR : GaAlAs



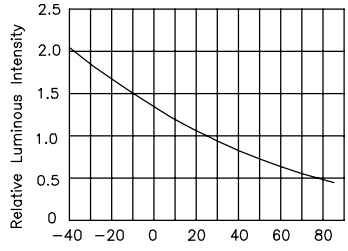
Forward Voltage(V)
FORWARD CURRENT Vs.
FORWARD VOLTAGE



IF—Forward Current (mA)
LUMINOUS INTENSITY Vs.
FORWARD CURRENT



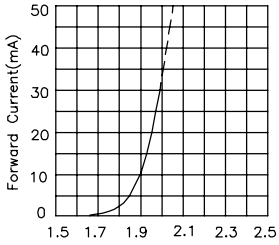
Ambient Temperature TA (°C)
FORWARD CURRENT
DERATING CURVE



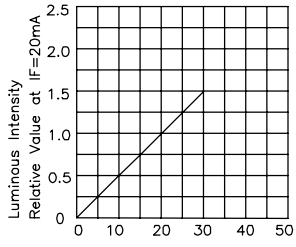
Ambient Temperature TA (°C)
LUMINOUS INTENSITY Vs.
AMBIENT TEMPERATURE

Hyper Red

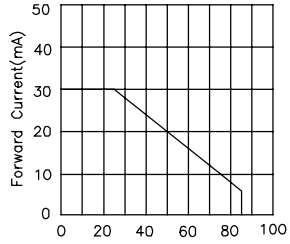
SURK : AlGaInP



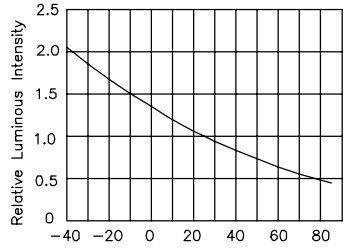
Forward Voltage(V)
FORWARD CURRENT Vs.
FORWARD VOLTAGE



IF—Forward Current (mA)
LUMINOUS INTENSITY Vs.
FORWARD CURRENT



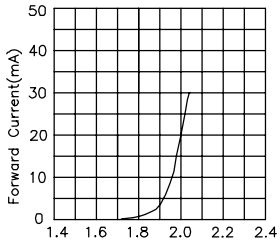
Ambient Temperature TA (°C)
FORWARD CURRENT
DERATING CURVE



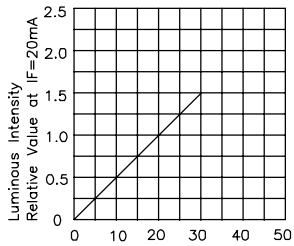
Ambient Temperature TA (°C)
LUMINOUS INTENSITY Vs.
AMBIENT TEMPERATURE

TECHNICAL DATA

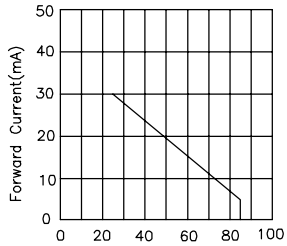
Hyper Red — SURK-T : AlGaInP



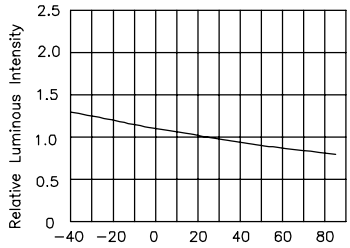
FORWARD CURRENT Vs. FORWARD VOLTAGE



LUMINOUS INTENSITY Vs. FORWARD CURRENT

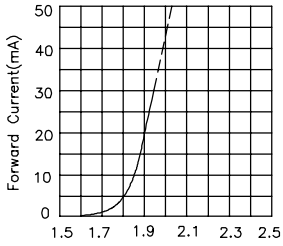


FORWARD CURRENT DERATING CURVE

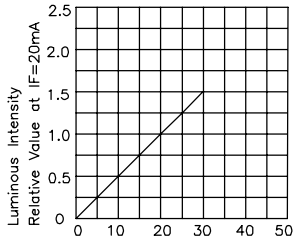


LUMINOUS INTENSITY Vs. AMBIENT TEMPERATURE

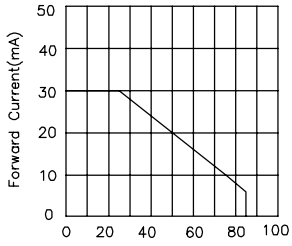
Hyper Red — SUR-E : AlGaInP



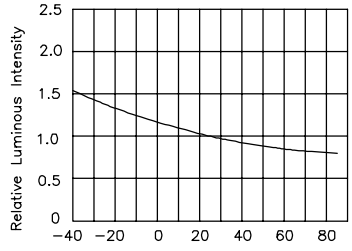
FORWARD CURRENT Vs. FORWARD VOLTAGE



LUMINOUS INTENSITY Vs. FORWARD CURRENT

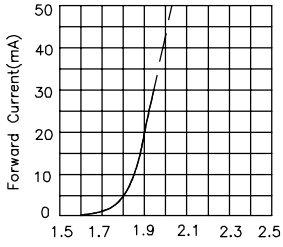


FORWARD CURRENT DERATING CURVE

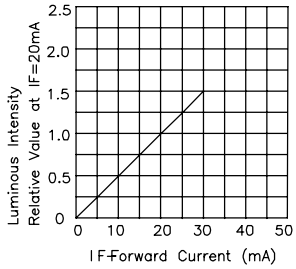


LUMINOUS INTENSITY Vs. AMBIENT TEMPERATURE

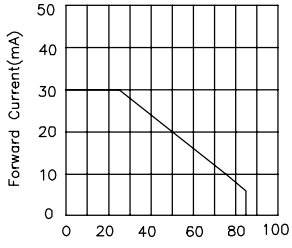
Hyper Red — SUR-G : AlGaInP



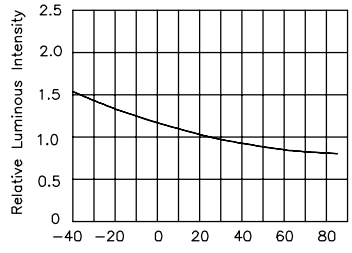
FORWARD CURRENT Vs. FORWARD VOLTAGE



LUMINOUS INTENSITY Vs. FORWARD CURRENT

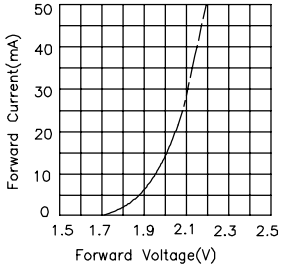


FORWARD CURRENT DERATING CURVE

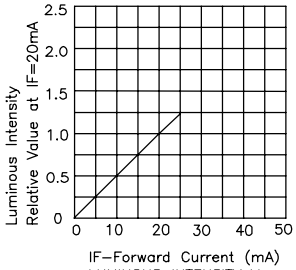


LUMINOUS INTENSITY Vs. AMBIENT TEMPERATURE

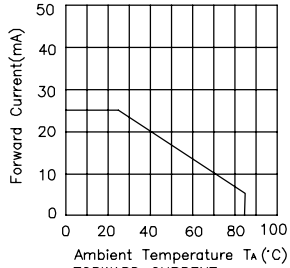
Pure Orange — N : GaAsP/GaP



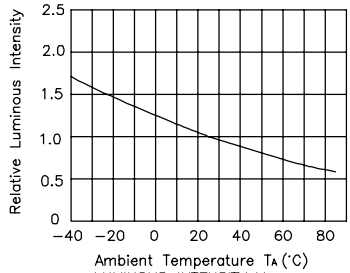
FORWARD CURRENT Vs. FORWARD VOLTAGE



LUMINOUS INTENSITY Vs. FORWARD CURRENT



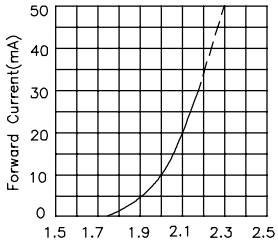
FORWARD CURRENT DERATING CURVE

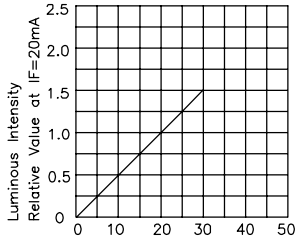


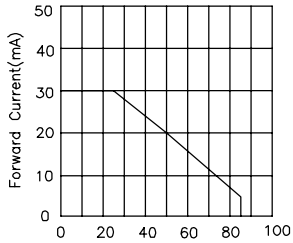
LUMINOUS INTENSITY Vs. AMBIENT TEMPERATURE

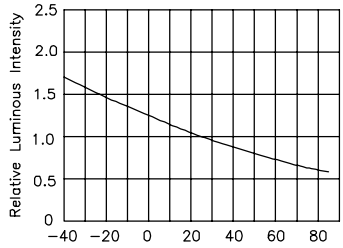
TECHNICAL DATA

Super Bright Orange — SEK : AlGaInP

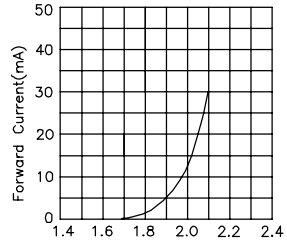


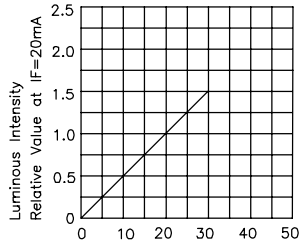


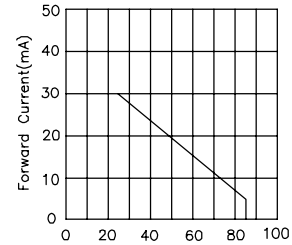


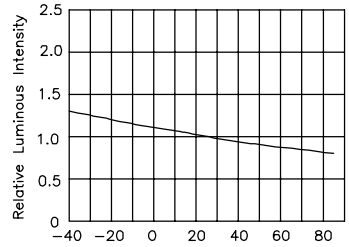


Super Bright Orange — SEK-T : AlGaInP

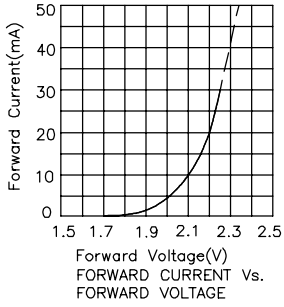


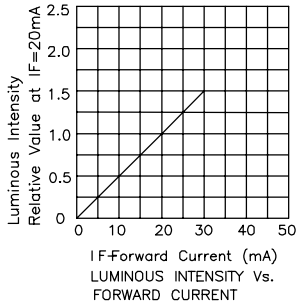


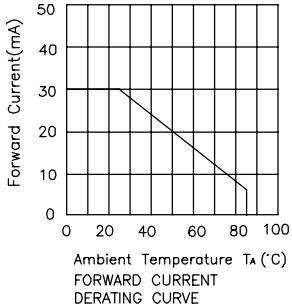


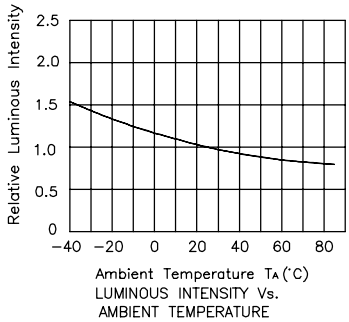


Hyper Orange — SE-H : AlGaInP

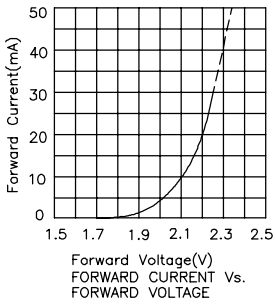


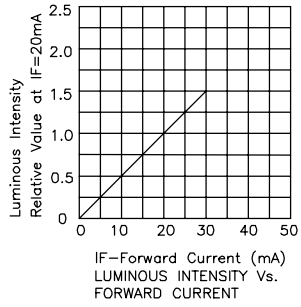


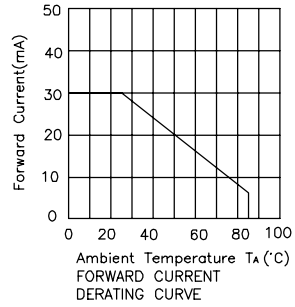


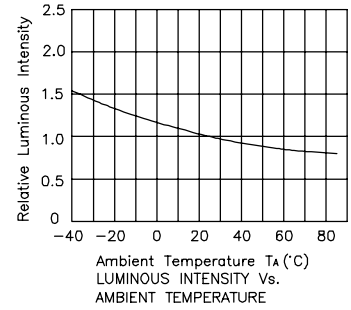


Hyper Red — SE-J3 : AlGaInP



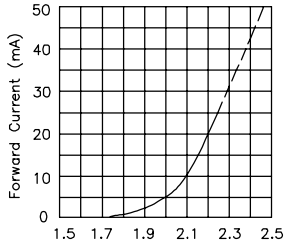




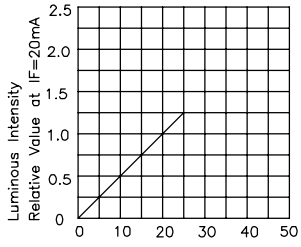


TECHNICAL DATA

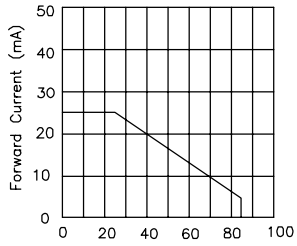
Green / Super Bright Green — G, SG : GaP



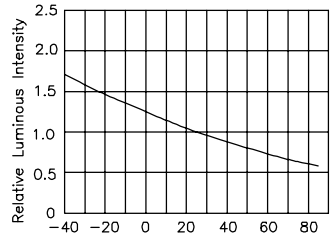
Forward Voltage(V)
FORWARD CURRENT Vs.
FORWARD VOLTAGE



IF–Forward Current (mA)
LUMINOUS INTENSITY Vs.
FORWARD CURRENT

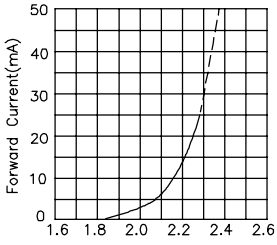


Ambient Temperature T_A (°C)
FORWARD CURRENT
DERATING CURVE

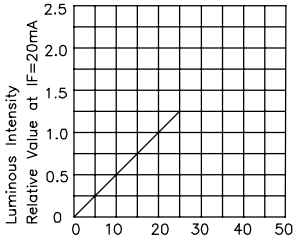


Ambient Temperature T_A (°C)
LUMINOUS INTENSITY Vs.
AMBIENT TEMPERATURE

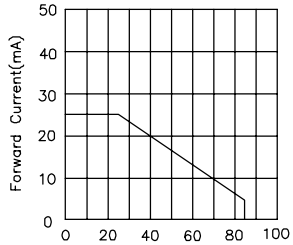
Pure Green — PG : GaP



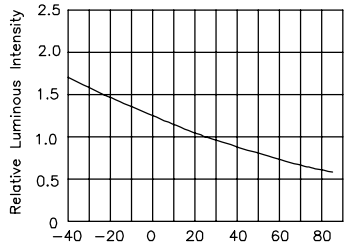
Forward Voltage(V)
FORWARD CURRENT Vs.
FORWARD VOLTAGE



IF–Forward Current (mA)
LUMINOUS INTENSITY Vs.
FORWARD CURRENT

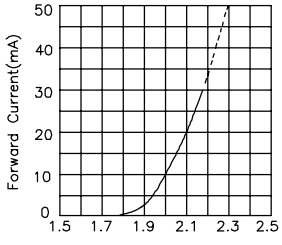


Ambient Temperature T_A (°C)
FORWARD CURRENT
DERATING CURVE

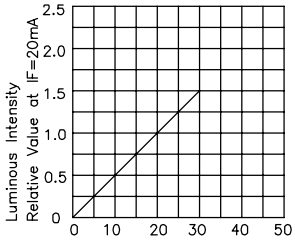


Ambient Temperature T_A (°C)
LUMINOUS INTENSITY Vs.
AMBIENT TEMPERATURE

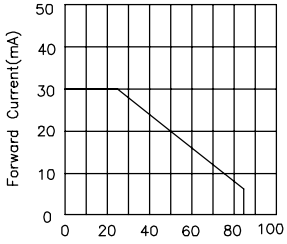
Green — CGK : AlGaInP



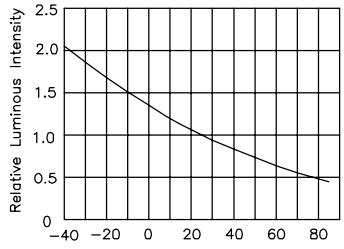
Forward Voltage(V)
FORWARD CURRENT Vs.
FORWARD VOLTAGE



IF–Forward Current (mA)
LUMINOUS INTENSITY Vs.
FORWARD CURRENT

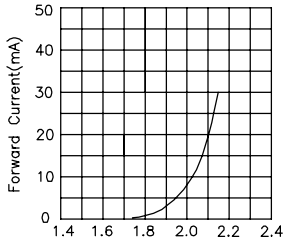


Ambient Temperature T_A (°C)
FORWARD CURRENT
DERATING CURVE

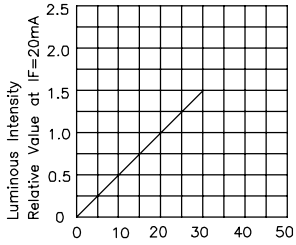


Ambient Temperature T_A (°C)
LUMINOUS INTENSITY Vs.
AMBIENT TEMPERATURE

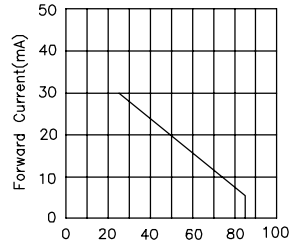
Green — CGK-T : AlGaInP



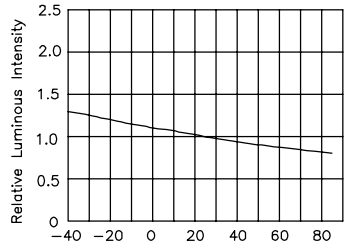
Forward Voltage(V)
FORWARD CURRENT Vs.
FORWARD VOLTAGE



IF–Forward Current (mA)
LUMINOUS INTENSITY Vs.
FORWARD CURRENT



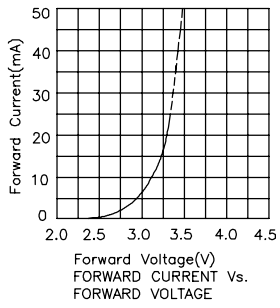
Ambient Temperature T_A (°C)
FORWARD CURRENT
DERATING CURVE

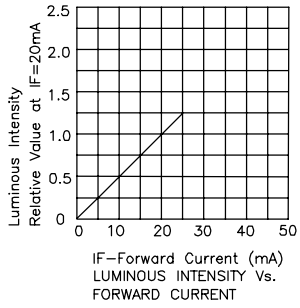


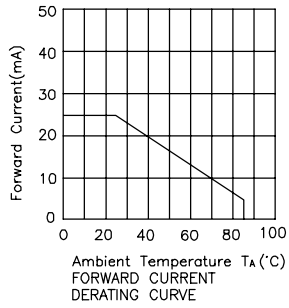
Ambient Temperature T_A (°C)
LUMINOUS INTENSITY Vs.
AMBIENT TEMPERATURE

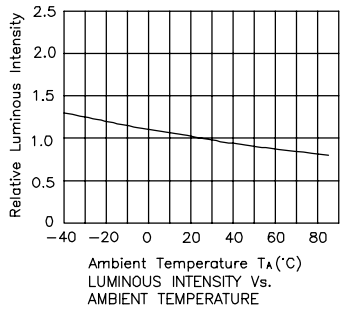
TECHNICAL DATA

Green — ZG : InGaN

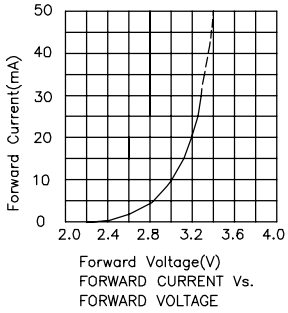


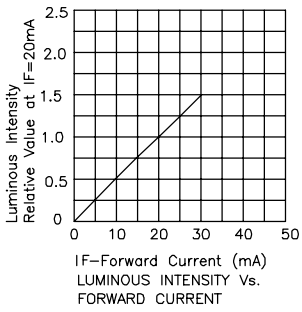


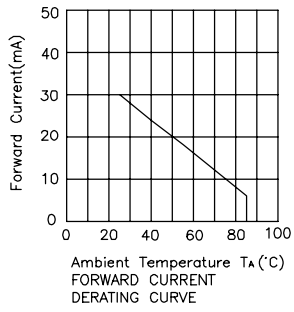


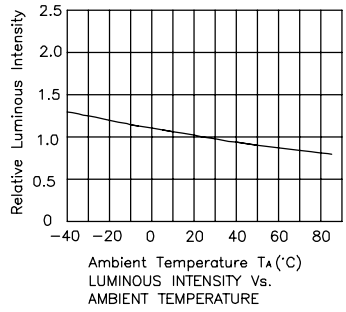


Green — ZG-E : InGaN

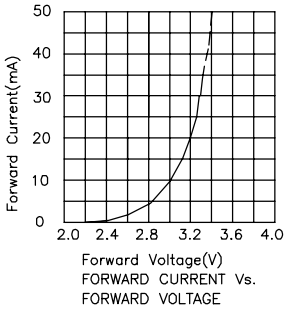


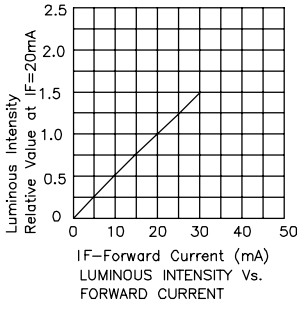


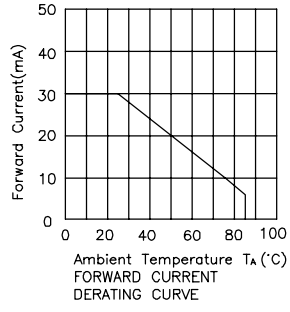


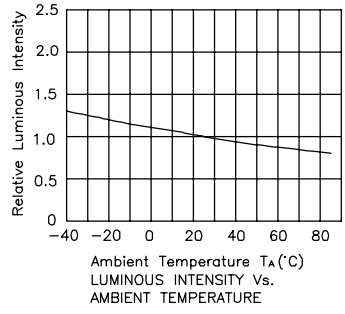


Green — ZG-G : InGaN

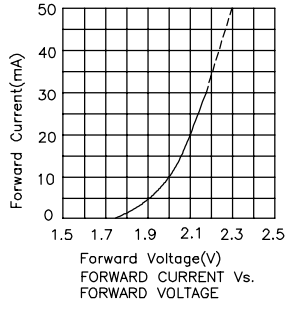


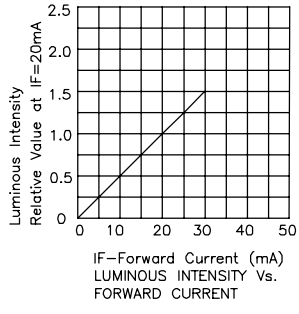


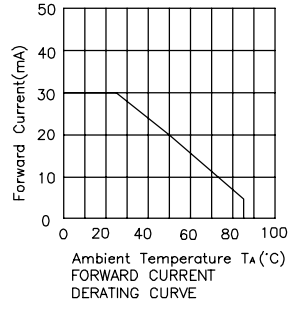


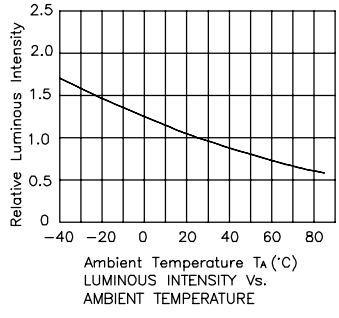


Yellow — Y : GaAsP/GaP



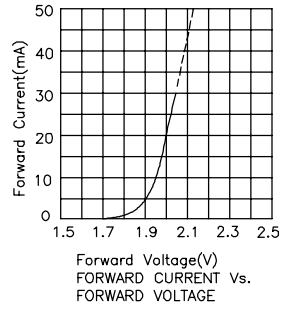




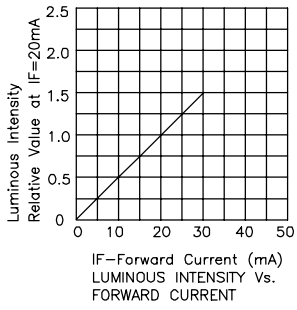


TECHNICAL DATA

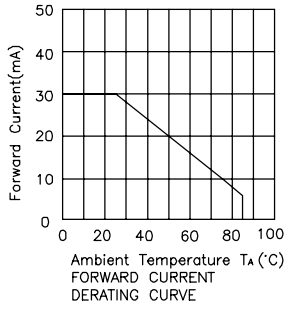
Super Bright Yellow — SYK : AlGaInP



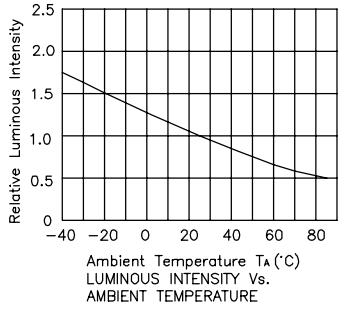
FORWARD CURRENT Vs.
FORWARD VOLTAGE



LUMINOUS INTENSITY Vs.
FORWARD CURRENT

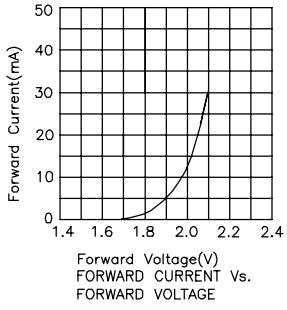


FORWARD CURRENT
DERATING CURVE

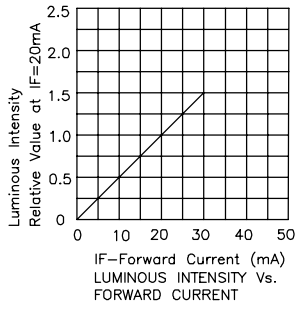


LUMINOUS INTENSITY Vs.
AMBIENT TEMPERATURE

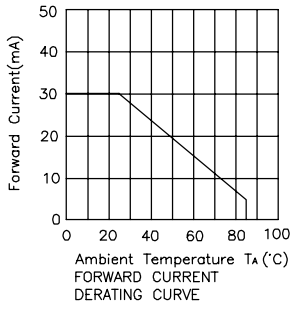
Super Bright Yellow — SYK-T : AlGaInP



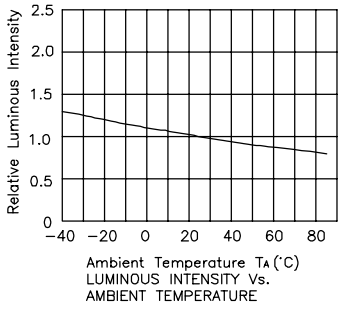
FORWARD CURRENT Vs.
FORWARD VOLTAGE



LUMINOUS INTENSITY Vs.
FORWARD CURRENT

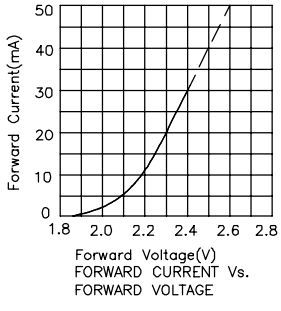


FORWARD CURRENT
DERATING CURVE

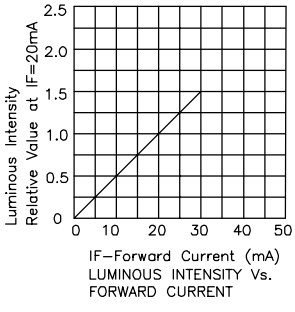


LUMINOUS INTENSITY Vs.
AMBIENT TEMPERATURE

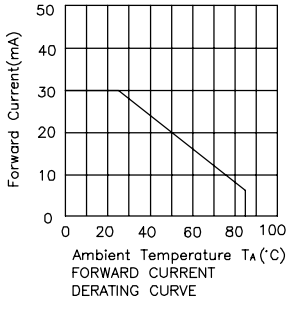
Super Bright Yellow — SY-H : AlGaInP



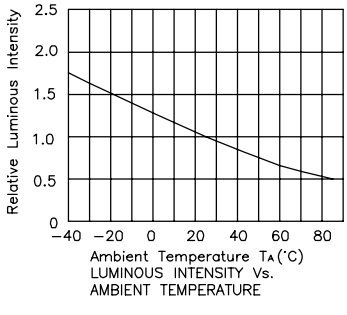
FORWARD CURRENT Vs.
FORWARD VOLTAGE



LUMINOUS INTENSITY Vs.
FORWARD CURRENT

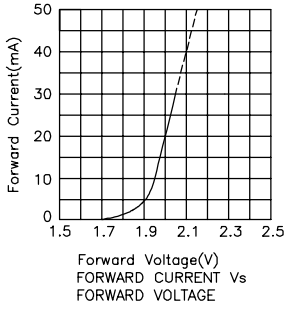


FORWARD CURRENT
DERATING CURVE

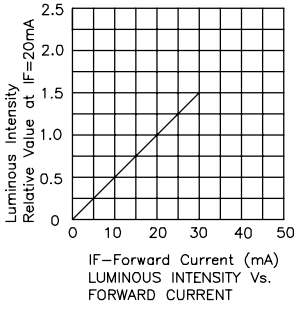


LUMINOUS INTENSITY Vs.
AMBIENT TEMPERATURE

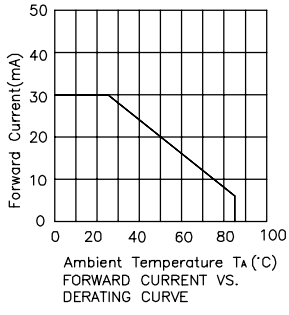
Super Bright Yellow — SY-J3 : AlGaInP



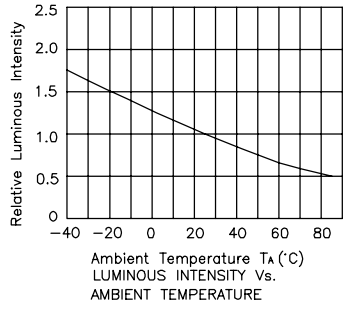
FORWARD CURRENT Vs
FORWARD VOLTAGE



LUMINOUS INTENSITY Vs.
FORWARD CURRENT



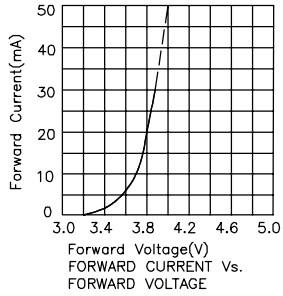
FORWARD CURRENT VS.
DERATING CURVE

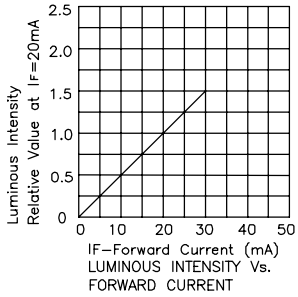


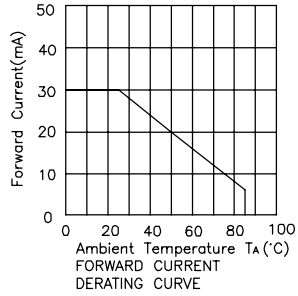
LUMINOUS INTENSITY Vs.
AMBIENT TEMPERATURE

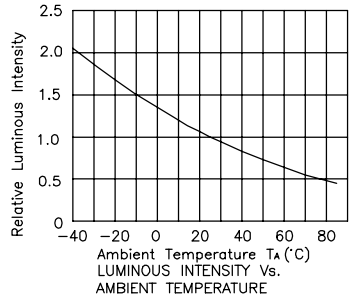
TECHNICAL DATA

Blue — MB : GaN

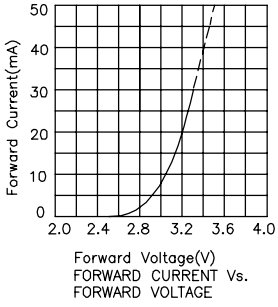


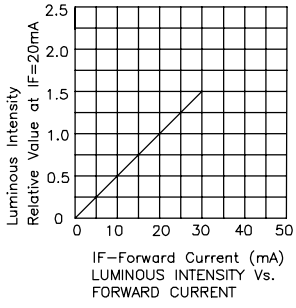


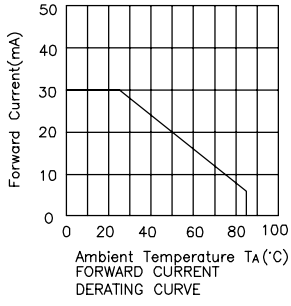


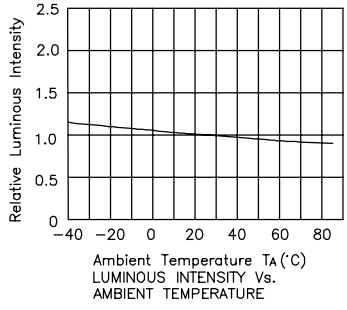


Blue — PB-A : InGaN

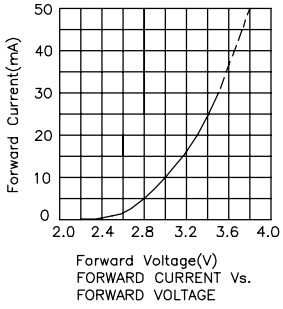


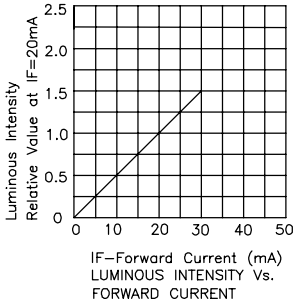


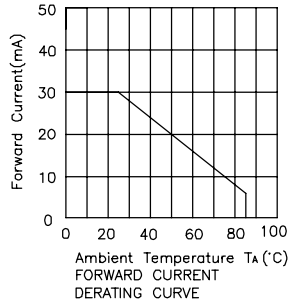


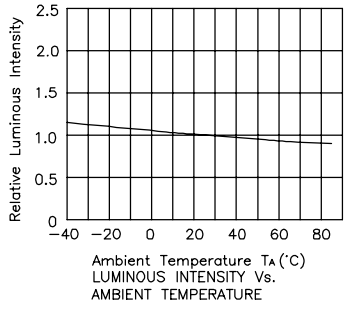


Blue — QB-D : InGaN

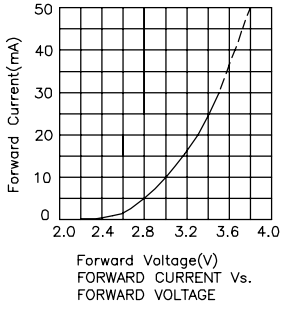


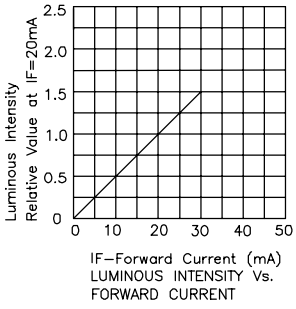


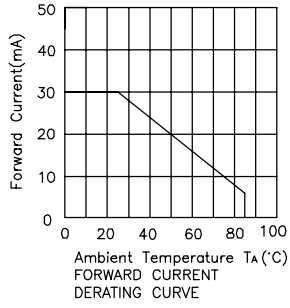


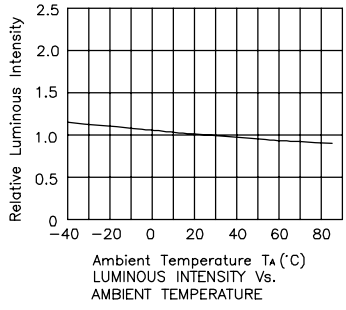


Blue — QB-F : InGaN



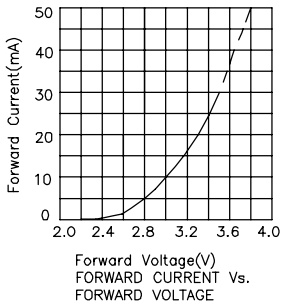


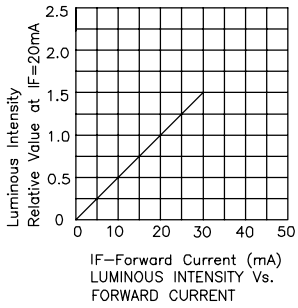


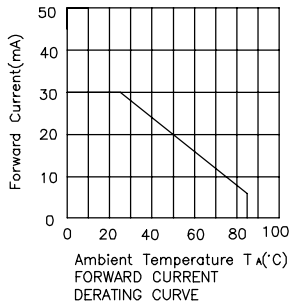


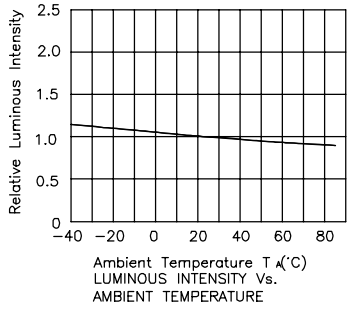
TECHNICAL DATA

Blue — QB-G : InGaN

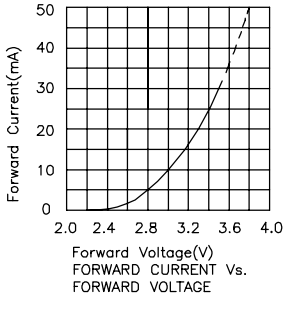


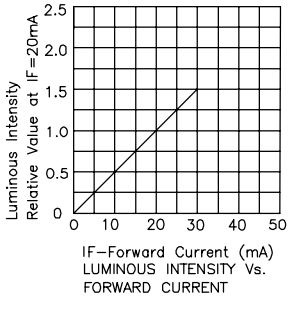


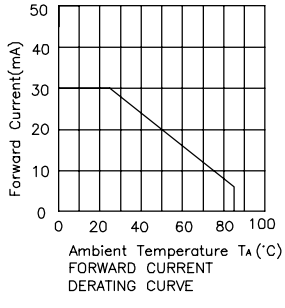


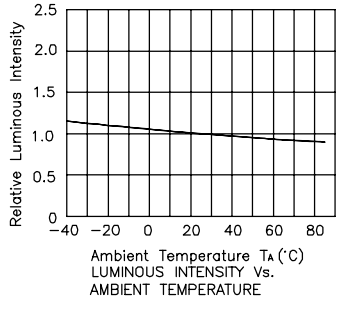


Blue — VB-D : InGaN









BIN CODE SYSTEMS

SELECTION CODE FOR STANDARD LEDS
(T_A=25°C;Tolerance: +/-15%)

Group	Light intensity in mcd(10mA)		Group	Light intensity in mcd(10mA)	
	Min.	Max.		Min.	Max.
F	0.1	0.2	W	120	180
G	0.2	0.35	X	180	250
H	0.35	0.5	Y	250	320
I	0.5	0.8	Z	320	450
K	0.8	1.2	ZA	450	550
L	1.2	2	ZB	550	700
M	2	4	ZC	700	1000
N	4	6	ZD	1000	1600
P	6	10	ZE	1600	2200
Q	10	15	ZF	2200	2800
R	15	20	ZG	2800	3400
S	20	30	ZH	3400	4300
T	30	50	ZM	4300	5200
U	50	80	ZN	5200	6300
V	80	120	ZP	6300	7400

SELECTION CODE FOR NPN PHOTOTRANSISTORS
(T_A=25°C;Tolerance: +/-15%)

Group	Photocurrent(mA)		Group	Photocurrent(mA)	
	Min.	Max.		Min.	Max.
F	0.1	0.2	L	1.2	2
G	0.2	0.35	M	2	4
H	0.35	0.5	N	4	6
I	0.5	0.8	P	6	10
K	0.8	1.2	-	-	-

SELECTION CODE FOR INFRARED EMITTING DIODES
(T_A=25°C;Tolerance: +/-15%)

Group	Radiant intensity in mW/sr(20mA)		Group	Radiant intensity in mW/sr(20mA)	
	Min.	Max.		Min.	Max.
AK	0.8	1.2	D	8	12
AL	1.2	2	E	12	20
A	2	3	F	20	40
B	3	5	G	40	55
C	5	8	H	55	80

SELECTION CODE FOR SUPER BRIGHT LEDS
(T_A=25°C;Tolerance: +/-15%)

Group	Light intensity in mcd(20mA)		Group	Light intensity in mcd(20mA)	
	Min.	Max.		Min.	Max.
A	2	3	ZA	3100	3600
B	3	5	ZB	3600	4200
C	5	8	ZC	4200	5000
D	8	12	ZD	5000	6000
E	12	20	ZE	6000	7000
F	20	40	ZF	7000	8000
G	40	55	ZG	8000	9000
H	55	80	ZH	9000	11000
M	80	120	ZM	11000	14000
N	120	200	ZN	14000	18000
P	200	300	ZP	18000	22000
Q	300	400	ZQ	22000	27000
R	400	500	ZR	27000	35000
S	500	700	ZS	35000	43000
T	700	1000	ZT	43000	55000
U	1000	1300	ZU	55000	75000
V	1300	1600	ZV	75000	130000
W	1600	1900	ZW	130000	200000
X	1900	2300	ZX	200000	320000
Y	2300	2700	ZY	320000	490000
Z	2700	3100	ZZ	490000	800000

SELECTION CODE FOR DISPLAYS
(T_A=25°C;Tolerance: +/-15%)

Group	Light intensity in ucd(10mA)		Group	Light intensity in ucd(10mA)	
	Min.	Max.		Min.	Max.
C	70	140	P	14000	21000
D	140	240	Q	21000	31000
E	240	360	R	31000	52000
F	360	560	S	52000	88000
G	560	900	T	88000	150000
H	900	1400	U	150000	255000
I	1400	2200	V	255000	433000
K	2200	3600	W	433000	736000
L	3600	5600	X	736000	1251000
M	5600	9000	Y	1251000	2126000
N	9000	14000	Z	2126000	3614000

BIN CODE SYSTEMS

SELECTION CODE FOR LUMINOUS FLUX

(T_A=25°C;Tolerance: +/-15%)

Group	Luminous Flux in lm		Group	Luminous Flux in lm	
	Min.	Max.		Min.	Max.
A1	0.5	0.6	B10	50	60
A2	0.6	0.7	B11	60	70
A3	0.7	0.8	B12	70	80
A4	0.8	1	B13	80	90
A5	1	1.2	B14	90	100
A6	1.2	1.4	C1	100	120
A7	1.4	1.7	C2	120	140
A8	1.7	2	C3	140	160
A9	2	2.4	C4	160	180
A10	2.4	2.9	C5	180	210
A11	2.9	3.5	C6	210	240
A12	3.5	4.2	C7	240	280
A13	4.2	5	C8	280	320
A14	5	6	C9	320	370
A15	6	7.2	C10	370	430
A16	7.2	8.6	C11	430	490
A17	8.6	10	C12	490	560
B1	10	12	C13	560	640
B2	12	14	C14	640	740
B3	14	17	C15	740	850
B4	17	20	C16	850	1000
B5	20	24	D1	1000	1200
B6	24	29	D2	1200	1400
B7	29	35	D3	1400	1600
B8	35	42	D4	1600	1800
B9	42	50	D5	1800	2100

COLOR CODE FOR GREEN LEDS + DISPLAYS

(TA =25°C; Tolerance: +/-1nm)

Group	Dom. Wavelength (nm)			
	G/SG, CGK, MG/ MGK Chip		VG + ZG Chip	
	Min.	Max.	Min.	Max.
0	556	559	-	-
1	559	561	515	520
2	561	563	520	525
3	563	565	525	530
4	565	567	530	535
5	567	569	535	540
6	569	571	-	-
7	571	573	-	-
8	573	575	-	-

COLOR CODE FOR BLUE LEDS + DISPLAYS

(TA =25°C; Tolerance: +/-1nm)

Group	Dom. Wavelength (nm)		Group	Dom. Wavelength (nm)	
	Min.	Max.		Min.	Max.
1	445	450	3A	471	473
2	450	455	3B	473	475
3	455	460	4A	475	477
1A	460	463	4B	477	479
1B	463	466	5A	479	481
2A	466	469	5B	481	483
2B	469	471	5C	483	486

COLOR CODE FOR YELLOW LEDS + DISPLAYS

(TA =25°C; Tolerance: +/-1nm)

Group	Dom. Wavelength (nm)		Group	Dom. Wavelength (nm)	
	Min.	Max.		Min.	Max.
1	581	584	5	590	592
2	584	586	6	592	594
3	586	588	7	594	597
4	588	590	8	597	600

SOLDERING INSTRUCTIONS

Types	Dip soldering / * wave soldering			Iron soldering (with 1.5mm iron tip)		
	Temperature of the soldering bath	Maximum soldering time	Distance from solder joint to package	Temperature of soldering iron	Maximum soldering time	Distance from solder joint to package
LEDS	<=260°C	3s	>=2mm	<=350°C	3s	>2mm
	<=260°C	5s	>=5mm	<=350°C	5s	>5mm
SMDS	-	-	-	<=350°C	3s (one time only)	-
DISPLAYS	*<=260°C	*3s	*>2mm	<=350°C	3s	>2mm
PHOTOCOUPLER	<=260°C	3s	>2mm	<=310°C	3s	-
	-	-	-	<=260°C	10s	-