

PRODUCT DATASHEET CA12427_TINA3-WW

TINA3-WW

~55° wide beam. Assembly with holder, installation tape and location pins.

SPECIFICATION:

Dimensions	Ø 16.1 mm
Height	6.9 mm
Fastening	tape, pin
ROHS compliant	yes 🛈



MATERIALS:

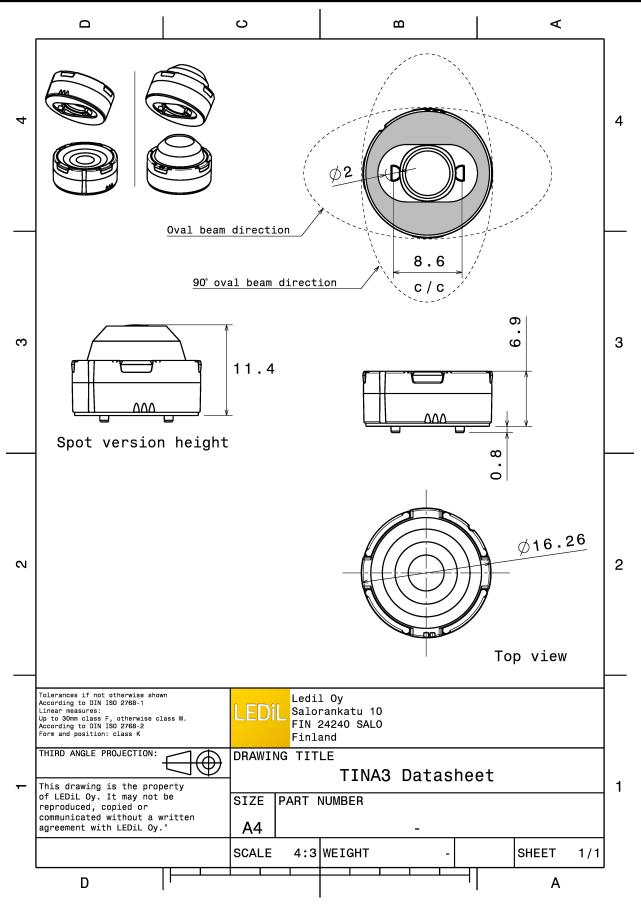
Component	Туре	Material	Colour	Finish
TINA3-WW	Single lens	PMMA	clear	
TINA3-HLD-PIN-TAPE	Holder	PC	white	
TINA-TAPE3	Tape	Acrylic foam	black	

ORDERING INFORMATION:

Component		Qty in box	MOQ	MPQ	Box weight (kg)
CA12427_TINA3-WW	Single lens	5750	230	230	8.4
» Box size: 451 x 241 x 298 mm					



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See also our general installation guide: www.ledil.com/installation_guide



		90* 90*
LED	XHP35 HI	
FWHM / FWTM	60.0° / 94.0°	75°
Efficiency	92 %	
Peak intensity	0.9 cd/lm	501 - 502
LEDs/each optic	1	
Light colour	White	97
Required componer		
		30-
		90* 90*
LED	XP-E2	
FWHM / FWTM	58.0° / 84.0°	
Efficiency	89 %	60°
Peak intensity	1.1 cd/lm	400
LEDs/each optic	1	
Light colour	White	42× 42*
Required componer	nts:	
		30-
		90* 90*
LED	XP-G	25. 26. 26.
LED FWHM / FWTM	XP-G 58.0° / 88.0°	20 22 80- 80- 80-
LED FWHM / FWTM Efficiency	XP-G 58.0° / 88.0° 89 %	61. 201 201 201 201 201 201 201 201 201 201
LED FWHM / FWTM Efficiency Peak intensity	XP-G 58.0° / 88.0° 89 % 1 cd/lm	94 97 97 97 97 97 97 97 97 97 97 97 97 97
LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic	XP-G 58.0° / 88.0° 89 % 1 cd/lm 1	9° 9° 73° 200 7° 73° 200 7° 80°
LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour	XP-G 58.0° / 88.0° 89 % 1 cd/lm 1 White	61
LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic	XP-G 58.0° / 88.0° 89 % 1 cd/lm 1 White	4. 4. 5. 6. 7. 7. 7. 7. 7. 7. 7. 7. 7. 7
LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour	XP-G 58.0° / 88.0° 89 % 1 cd/lm 1 White	50 50 50 50 50 50 50 50 50 50 50 50 50 5
LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour	XP-G 58.0° / 88.0° 89 % 1 cd/lm 1 White	9°
LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour	XP-G 58.0° / 88.0° 89 % 1 cd/lm 1 White	20° 10° 10° 20° 10° 20° 20° 20° 20° 20° 20° 20° 20° 20° 20° 20° 20° 20° 20° 20° 20° 20° 20° 20° 20° 20° 20° 20° 20° 20° 20° 20° 20° 20° 20° 20° 20° 20° 20° 20° 20° 20° 20° 20° 20°
LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required componen	XP-G 58.0° / 88.0° 89 % 1 cd/lm 1 White nts:	Bit Bit Bit 100 Bit
LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required component	XP-G 58.0° / 88.0° 89 % 1 cd/lm 1 White hts:	20 20 20 20 20 20 20 20 20 20
LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required component	XP-G 58.0° / 88.0° 89 % 1 cd/lm 1 White hts: XP-G2	20 20 20 20 20 20 20 20 20 20
LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required component CREE LED LED FWHM / FWTM	XP-G 58.0° / 88.0° 89 % 1 cd/lm 1 White hts: XP-G2 59.0° / 89.0°	20 20 20 20 20 20 20 20 20 20
LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required component Required component LED FWHM / FWTM Efficiency	XP-G 58.0° / 88.0° 89 % 1 cd/lm 1 White hts: XP-G2 59.0° / 89.0° 90 %	20 20 20 20 20 20 20 20 20 20
LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required component Required component LED FWHM / FWTM Efficiency Peak intensity	XP-G 58.0° / 88.0° 89 % 1 cd/lm 1 White hts: XP-G2 59.0° / 89.0°	20 20 20 20 20 20 20 20 20 20
LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required component Required component LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic	XP-G 58.0° / 88.0° 89 % 1 cd/lm 1 White hts: XP-G2 59.0° / 89.0° 90 % 0.9 cd/lm 1	20 20 20 20 20 20 20 20 20 20
LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required component Required component ELED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour	XP-G 58.0° / 88.0° 89 % 1 cd/lm 1 White hts: XP-G2 59.0° / 89.0° 90 % 0.9 cd/lm 1 White	20 20 20 20 20 20 20 20 20 20
LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required component Required component LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic	XP-G 58.0° / 88.0° 89 % 1 cd/lm 1 White hts: XP-G2 59.0° / 89.0° 90 % 0.9 cd/lm 1 White	20 20 20 20 20 20 20 20 20 20
LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required component Required component ELED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour	XP-G 58.0° / 88.0° 89 % 1 cd/lm 1 White hts: XP-G2 59.0° / 89.0° 90 % 0.9 cd/lm 1 White	20 20 20 20 20 20 20 20 20 20
LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required component Required component ELED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour	XP-G 58.0° / 88.0° 89 % 1 cd/lm 1 White hts: XP-G2 59.0° / 89.0° 90 % 0.9 cd/lm 1 White	20 20 20 20 20 20 20 20 20 20



		95* 55
LED	XP-L HI	
FWHM / FWTM	58.0° / 87.0°	
Efficiency	92 %	
Peak intensity	0.9 cd/lm	
LEDs/each optic	1	
Light colour	White	gr and a second s
Required compone		
		30" 35" 1000 25" 34
		50 ³ 50 ³
LED	XT-E	77
FWHM / FWTM	56.0° / 86.0°	
Efficiency	87 %	
Peak intensity	1 cd/lm	
LEDs/each optic	1	
Light colour	White	
Required compone	nts:	
		36 36
	FDS	25 [°] 6 [°] 35 [°]
	LUXEON 2835 Line	
LED		
		7. 7.
FWHM / FWTM	60.0° / 92.0°	
FWHM / FWTM Efficiency	60.0° / 92.0° 92 %	
FWHM / FWTM Efficiency Peak intensity	60.0° / 92.0° 92 % 0.9 cd/lm	
FWHM / FWTM Efficiency Peak intensity LEDs/each optic	60.0° / 92.0° 92 % 0.9 cd/lm 1	
FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour	60.0° / 92.0° 92 % 0.9 cd/lm 1 White	
FWHM / FWTM Efficiency Peak intensity LEDs/each optic	60.0° / 92.0° 92 % 0.9 cd/lm 1 White	
FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour	60.0° / 92.0° 92 % 0.9 cd/lm 1 White	
FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour	60.0° / 92.0° 92 % 0.9 cd/lm 1 White	
FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required compone	60.0° / 92.0° 92 % 0.9 cd/lm 1 White nts:	
FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required compone	60.0° / 92.0° 92 % 0.9 cd/lm 1 White nts:	
FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour	60.0° / 92.0° 92 % 0.9 cd/lm 1 White nts:	
FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required compone	60.0° / 92.0° 92 % 0.9 cd/lm 1 White nts:	
FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required compone	60.0° / 92.0° 92 % 0.9 cd/lm 1 White nts:	
FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required compone	60.0° / 92.0° 92 % 0.9 cd/lm 1 White nts: EDS LUXEON A 58.0° / 88.0°	
FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required compone COMPUTED ED FWHM / FWTM Efficiency	60.0° / 92.0° 92 % 0.9 cd/lm 1 White nts: EDS LUXEON A 58.0° / 88.0° 89 %	
FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required compone COMPARENT LED FWHM / FWTM Efficiency Peak intensity	60.0° / 92.0° 92 % 0.9 cd/lm 1 White nts: EDS LUXEON A 58.0° / 88.0° 89 % 0.9 cd/lm	
FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required compone Composition Required compone Efficiency Peak intensity LEDs/each optic	60.0° / 92.0° 92 % 0.9 cd/lm 1 White nts: EDS LUXEON A 58.0° / 88.0° 89 % 0.9 cd/lm 1 White	
FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required compone Composition Required compone Composition LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour	60.0° / 92.0° 92 % 0.9 cd/lm 1 White nts: EDS LUXEON A 58.0° / 88.0° 89 % 0.9 cd/lm 1 White	
FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required compone Composition Required compone Composition LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour	60.0° / 92.0° 92 % 0.9 cd/lm 1 White nts: EDS LUXEON A 58.0° / 88.0° 89 % 0.9 cd/lm 1 White	79° 200 60° 200 200
FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required compone Composition Required compone Composition LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour	60.0° / 92.0° 92 % 0.9 cd/lm 1 White nts: EDS LUXEON A 58.0° / 88.0° 89 % 0.9 cd/lm 1 White	795 - 200 600 - 604 400



-		 	
			90°
LED	LUXEON T		75.
FWHM / FWTM	61.0° / 90.0°		200
Efficiency	87 %		60° 60°
Peak intensity	0.9 cd/lm		
LEDs/each optic	1		
Light colour	White		è.
Required compone	nts:		
			36° 36° 36°
UMIL	EDS		50° 50°
LED	LUXEON TX		
FWHM / FWTM	63.0° / 93.0°		73.
Efficiency	87 %		- 200
Peak intensity	0.8 cd/lm		601- BQ*
LEDs/each optic	1		
Light colour	White		957 43*
Required compone			
			360 300
			15° 0° 15°
LED	NF2x757A		
EED FWHM / FWTM	60.0° / 92.0°		
Efficiency	85 %		
Peak intensity	0.9 cd/lm		
LEDs/each optic	1		
Light colour	White		
Required compone			
			90*
			9 ⁴
LED	NVSxx19A		73 26 26
LED FWHM / FWTM	NVSxx19A 62.0° / 94.0°		
LED FWHM / FWTM Efficiency	NVSxx19A 62.0° / 94.0° 86 %		
LED FWHM / FWTM Efficiency Peak intensity	NVSxx19A 62.0° / 94.0° 86 % 0.8 cd/lm		
LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic	NVSxx19A 62.0° / 94.0° 86 % 0.8 cd/lm 1		
LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour	NVSxx19A 62.0° / 94.0° 86 % 0.8 cd/lm 1 White		749 200 69 ⁴ 60 ⁴
LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic	NVSxx19A 62.0° / 94.0° 86 % 0.8 cd/lm 1 White		74° - 75° 60° - 60° - 75°
LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour	NVSxx19A 62.0° / 94.0° 86 % 0.8 cd/lm 1 White		749 200 69 ⁴ 60 ⁴
LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour	NVSxx19A 62.0° / 94.0° 86 % 0.8 cd/lm 1 White		749 200 69 ⁴ 60 ⁴



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ØNICHI		90* 90*
LED	NVSxx19B/NVSxx19C	73*
FWHM / FWTM	62.0° / 93.0°	
Efficiency	91 %	60*
Peak intensity	0.8 cd/lm	
LEDs/each optic	1	
Light colour	White	42° 42°
Required compone	nts:	
		36* 36*
0000414		
OSRAM Opto Semiconductors		90° 90°
LED	OSLON Square EC	
FWHM / FWTM	58.0° / 91.0°	200
Efficiency	87 %	60*
Peak intensity	0.9 cd/lm	
LEDs/each optic	1	
Light colour	White	42*
Required compone	nts:	660
		30° 30°
S ΛΜSΙ		
		90° 90°
LED	LH351B	75
FWHM / FWTM	59.0° / 91.0°	
Efficiency	87 %	60°
Peak intensity	0.9 cd/lm	400
LEDs/each optic		
Light colour	White	
Required compone	IIS	
		30°
O D D D D D D D D D D		
SAMSI		90* 90*
SAMSU		50 ⁴ 50 ⁴
LED	LH351Z	13. 24. 26.
LED FWHM / FWTM	LH351Z 68.0° / 96.0°	
LED FWHM / FWTM Efficiency	LH351Z 68.0° / 96.0° 88 %	
LED FWHM / FWTM Efficiency Peak intensity	LH351Z 68.0° / 96.0° 88 % 0.8 cd/lm	
LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic	LH351Z 68.0° / 96.0° 88 % 0.8 cd/lm 1	
LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour	LH351Z 68.0° / 96.0° 88 % 0.8 cd/m 1 White	
LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic	LH351Z 68.0° / 96.0° 88 % 0.8 cd/m 1 White	
LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour	LH351Z 68.0° / 96.0° 88 % 0.8 cd/m 1 White	
LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour	LH351Z 68.0° / 96.0° 88 % 0.8 cd/m 1 White	



OPTICAL RESULTS (SIMULATED):

UMILEC	DS	90* 90'
LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required components:	LUXEON H50-2 64.0° / 82.0° 87 % 0.9 cd/lm 1 White	25 - 20 95 - 40 77 - 40 27 - 40 28 - 40 27 - 40 28 - 40 29 - 40 29 - 40 29 - 40 20
ΜΝΙCΗΙΛ		90° 90'
LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required components:	NCSxE17A 60.0° / 81.0° 80 % 0.9 cd/lm 1 White	200 200 200 200 200 000 000 000
ΜΝΙCΗΙΛ		90 ⁴
LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required components:	NF2x757G 57.0° / 89.0° 88 % 1 cd/lm 1 White	
MNICHIA		90* 90'
LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required components:	NVSxE21A 62.0° / 92.0° 90 % 0.9 cd/lm 1 White	



OPTICAL RESULTS (SIMULATED):

OSRAM Opto Semiconductors		90° 90°
LED	OSLON SSL 120	
FWHM / FWTM	61.0° / 83.0°	73,
Efficiency	87 %	
Peak intensity	1 cd/lm	60* 60*
LEDs/each optic	1	
Light colour	Amber	57° (5°
Required components:		
		800
		15° 0° 15°
OSRAM Opto Semiconductors		90° 90°
LED	SYNIOS S2222	
FWHM / FWTM	58.0° / 78.0°	
Efficiency	95 %	
Peak intensity	1.1 cd/lm	
LEDs/each optic	1	
Light colour	White	g*
Required components:		
		30-
		15% 1980 15%
SAMSUN	IG	90* 90*
LED	LM28xB Series	
LED FWHM / FWTM		77 200
	LM28xB Series	75 20 27
FWHM / FWTM	LM28xB Series 62.0° / 88.0°	25
FWHM / FWTM Efficiency	LM28xB Series 62.0° / 88.0° 92 %	20
FWHM / FWTM Efficiency Peak intensity	LM28xB Series 62.0° / 88.0° 92 % 0.9 cd/lm	20 - 20 9 - 40 0
FWHM / FWTM Efficiency Peak intensity LEDs/each optic	LM28xB Series 62.0° / 88.0° 92 % 0.9 cd/lm 1	75
FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour	LM28xB Series 62.0° / 88.0° 92 % 0.9 cd/lm 1	75
FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour	LM28xB Series 62.0° / 88.0° 92 % 0.9 cd/lm 1	25 20 57 64 40 - 65 60 67 86 7
FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour	LM28xB Series 62.0° / 88.0° 92 % 0.9 cd/lm 1	61
FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required components:	LM28xB Series 62.0° / 88.0° 92 % 0.9 cd/lm 1 White	61 60
FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour	LM28xB Series 62.0° / 88.0° 92 % 0.9 cd/lm 1 White	54 64 64 64 64 64 64 64 64 64 6
FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required components:	LM28xB Series 62.0° / 88.0° 92 % 0.9 cd/lm 1 White	54° 50° 50° 50° 50° 50° 50° 50° 50° 50° 50
FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required components:	LM28xB Series 62.0° / 88.0° 92 % 0.9 cd/lm 1 White	54 64 64 64 64 64 64 64 64 64 6
FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required components: SAMSUN LED	LM28xB Series 62.0° / 88.0° 92 % 0.9 cd/lm 1 White	3. 3. 3. 3. 3. 3. 3. 3. 3. 3.
FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required components: SAMSUN LED FWHM / FWTM Efficiency Peak intensity	LM28xB Series 62.0° / 88.0° 92 % 0.9 cd/lm 1 White G LM301B 62.0° / 87.0°	3. 3. 3. 3. 3. 3. 3. 3. 3. 3.
FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required components: SAMSUN LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic	LM28xB Series 62.0° / 88.0° 92 % 0.9 cd/lm 1 White	3. 3. 3. 3. 3. 3. 3. 3. 3. 3.
FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required components: SAMSUN LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour	LM28xB Series 62.0° / 88.0° 92 % 0.9 cd/lm 1 White	3. 3. 3. 3. 3. 3. 3. 3. 3. 3.
FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required components: SAMSUN LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic	LM28xB Series 62.0° / 88.0° 92 % 0.9 cd/lm 1 White	32 35 36 36 36 36 36 36 36 36 36 37 36 37 36 37 36 37 36 37 36 37 37 36 37 37 37 37 37 37 37 37 37 37
FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required components: SAMSUN LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour	LM28xB Series 62.0° / 88.0° 92 % 0.9 cd/lm 1 White	32 35 36 36 36 36 36 36 36 36 36 37 36 37 36 37 36 37 36 37 36 37 37 36 37 37 37 37 37 37 37 37 37 37
FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required components: SAMSUN LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour	LM28xB Series 62.0° / 88.0° 92 % 0.9 cd/lm 1 White	32 35 36 36 36 36 36 36 36 36 36 37 36 37 36 37 36 37 36 37 36 37 37 36 37 37 37 37 37 37 37 37 37 37
FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour Required components: SAMSUN LED FWHM / FWTM Efficiency Peak intensity LEDs/each optic Light colour	LM28xB Series 62.0° / 88.0° 92 % 0.9 cd/lm 1 White	32 35 36 36 36 36 36 36 36 36 36 37 36 37 36 37 36 37 36 37 36 37 37 36 37 37 37 37 37 37 37 37 37 37



OPTICAL RESULTS (SIMULATED):

SEOUL SEOUL SEMICONDUCTOR		90° 90°
LED	Z5M1/Z5M2	77
FWHM / FWTM	61.0° / 86.0°	200
Efficiency	94 %	60°
Peak intensity	1 cd/lm	40
LEDs/each optic	1	
Light colour	White	97 90 97
Required components:		34 <u>1000</u> 35 34
SEOUL SEMICONDUCTOR		90 ⁴ 90 ⁴
LED	Z8Y22P	75*
FWHM / FWTM	62.0° / 92.0°	75 200
Efficiency	92 %	601 604
Peak intensity	0.9 cd/lm	
LEDs/each optic	1	
Light colour	White	42°
Required components:		50 50 50 50 50 50 50 50 50 50 50 50 50 5



PRODUCT DATASHEET CA12427_TINA3-WW

GENERAL INFORMATION:

NOTE: The typical beam angle will be changed by different color, chip size and chip position tolerance. The typical total beam angle is the full angle measured where the luminous intensity is half of the peak value.

MATERIALS:

As part of our continuous research and improvement processes, and to ensure the best possible quality and availability of our products, LEDiL reserves the right to change material grades without notice.

PRODUCT DATA USER AGREEMENT AND DISCLAIMER:

The measured data in the provided downloadable LEDiL Product Datasheets and Mechanical 2D-Drawings is rounded and provided as reference for planning. LEDiL Oy's optical specifications have been verified by conducting performance testing of the products in accordance with the company's quality system. The reported data are averaged results of multiple measurements with typical variation. LEDiL Oy reserves the right to without prior notification make changes and improvements to its products.

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LEDiL Oy

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