

## DETAILED DATA SHEET

### XIM LED Modules

with Corrected Cold Phosphor Technology®

Standard Series



#### About Xicato

Xicato designs and develops light sources and electronics that enable architects, designers and building managers to create beautiful, smart spaces in which people love to live and work. With thousands of installations around the globe, Xicato continues to be a leading supplier of high quality lighting solutions. Xicato is defining the future of intelligent light sources by integrating electronics, software and connectivity. Founded in 2007, Xicato's headquarters is based in Silicon Valley and the company has offices in China, Europe and the US.

For further information, visit [www.xicato.com](http://www.xicato.com).

## GENERAL DESCRIPTION

### XIM

The Xicato Intelligent Module (XIM) is a compact, integrated LED lighting module designed to fit a wide variety of downlight and spot fixtures, and to simplify the design and assembly of controllable LED luminaires. The XIM includes:

- LED emitting core
- Drive electronics – constant voltage to constant current (dimnable)
- Microprocessor with firmware and static random access memory (SRAM)
- Internal sensors that detect intensity, LED and PCB temperature, power, and other operating parameters
- Bluetooth Smart wireless transceiver (XIM Gen4 only)

The extremely high quality, integrated XIM driver dims more smoothly and deeply than high-end standalone LED drivers. Combined with Xicato's industry leading color quality, consistency and application-optimized light spectra, XIM provides simply the most beautiful lit effect.

Integration makes the XIM more affordable to implement and enables smaller downlight or spotlight fixtures.

Xicato is the only light source provider to give a long term warranty on both output and color consistency, creating a strong case for lowest total cost of ownership and smallest ecological footprint, while insuring consistent lighting design quality for the life of the installation.

Over its broad dimming range, XIM exceeds the highest international standards for avoiding health effects related to flicker - it is the only LED solution to achieve this.

### XIM GENERATION 4 (XIM GEN4)

To the standard XIM, XIM Gen4 adds Bluetooth wireless connectivity and the distributed intelligence required to respond to all types of sensors, switches, and mobile app commands. XIM Gen4 is a control system, a beacon, and an intelligent IoT (Internet of Things) node that fundamentally changes the economics of lighting control, smart spaces and the lighting industry. XIM Gen4 dramatically simplifies and cost reduces the planning, installation, provisioning, control and management of controlled lighting, while enabling new location-based information services.

XIM Gen4 is about more than Lighting. XIM Gen4 can advertise Google Eddystone and/or Apple iBeacons, providing wayfinding and other location-based information about such things as museum exhibits, retail merchandise, or restaurant menus.

XIM Gen4 is part of a total ecosystem with compatible software, motion, lux, temperature, humidity and vibration sensors, switches, and gateways. Built on the ubiquitous Bluetooth standard already in billions of smartphones and tablets, Xicato has opened its software interfaces (APIs) to enable third-party developers to write their own apps, expanding opportunities for OEMs, lighting designers, M&Es, and end users.

### STANDARD SERIES

Xicato Standard Series products are designed to provide excellent, natural color rendition with high efficiency. XIM Standard Series comes in 2700K, 3000K, 3500K and 4000K CCT, and in flux packages from 700 to 3000 lumens, delivering typical CRI (R<sub>a</sub>) of 83, and consistently high R values across all 15 CIE CRI samples.

## XICATO CORRECTED COLD PHOSPHOR PORTFOLIO (SEE ALSO XLT)

Xicato Portfolio	Lumen Output	Correlated Color Temperature			
		2700K	3000K	3500K	4000K
<b>Artist Series®</b> CIE CRI: Ra 95+, R9 90+ IES TM-30: Rf 96, Rg 103	700	⊙	⊙	⊙	⊙
	1300	⊙	⊙	⊙	⊙
	2000	•	⊙	•	•
	3000	•	•	•	•
	4000	•	•	•	•
<b>Beauty Series™</b> CIE CRI: Ra 95 IES TM-30: Rf 91, Rg 107	1300		⊙		
	2000		⊙		
<b>Designer Series™</b> CIE CRI: Ra 90+, R9 50+ IES TM-30: Rf 88, Rg 101	700	⊙	⊙	⊙	⊙
	1300	⊙	⊙	⊙	⊙
	2000	⊙	⊙	⊙	⊙
	3000	⊙	⊙	⊙	⊙
	4500		•	•	•
<b>Standard Series</b> CIE CRI: Ra 80+ IES TM-30: Rf 78, Rg 101	700	⊙	⊙	⊙	⊙
	1300	⊙	⊙	⊙	⊙
	2000	⊙	⊙	⊙	⊙
	3000		⊙	⊙	⊙
	4000		•	•	•
	5000		•	•	•
<b>Vibrant Series® V80</b> CIE CRI: Ra 80+ IES TM-30: Rf 73, Rg 105	700		⊙		
	1300		⊙	⊙	
	2000		⊙	⊙	
	3000		⊙	⊙	
	4000		•	•	
	5000		•	•	
<b>Vibrant Series® V95</b> CIE CRI: Ra 95+ IES TM-30: Rf 93, Rg 106	700		⊙		
	1300		⊙	⊙	
	2000		•	⊙	
	3000		•	•	
	4000		•	•	

LEGEND	XCA+XTM	+XIM
9mm LES	•	⊙
19mm LES	•	⊙

Note:  
CRI listed as XX+ are guaranteed minimum values. Typical values are min+3.

## ORDERING GUIDE

### PART NUMBERING SYSTEM

NOTE that all combinations are not available. Please see listing, below.

XIM	19	95	30	13	A2	A
XCA: Xicato Core Array XIM: Xicato Intelligent Module XTM: Xicato Thin Module	Light Emitting Surface (LES mm) 09: 9 19: 19	Series 80: Standard 90: Designer 95: Artist BT: Beauty V8: Vibrant 80 V9: Vibrant 95	CCT (K) 27: 2700 30: 3000 35: 3500 40: 4000 01: NA	Flux (nominal) 07: 700 13: 1300 20: 2000 etc.	Feature Group A2: DALI A3: 1-10V A5: BLE+DALI A6: BLE+1-10V CC: constant current	Revision

### PART CODES AND DESCRIPTIONS

#### XIM STANDARD SERIES WITH 9MM LIGHT EMITTING SURFACE (LES)

Part Number	Description
XIM09802707A2A	LED Module, XIM, LES09, Standard, 2700K, 700LM, DALI
XIM09802707A3A	LED Module, XIM, LES09, Standard, 2700K, 700LM, 1-10V
XIM09802707A5A	LED Module, XIM, LES09, Standard, 2700K, 700LM, DALI+BLE
XIM09802707A6A	LED Module, XIM, LES09, Standard, 2700K, 700LM, 1-10V+BLE
XIM09802713A2A	LED Module, XIM, LES09, Standard, 2700K, 1300LM, DALI
XIM09802713A3A	LED Module, XIM, LES09, Standard, 2700K, 1300LM, 1-10V
XIM09802713A5A	LED Module, XIM, LES09, Standard, 2700K, 1300LM, DALI+BLE
XIM09802713A6A	LED Module, XIM, LES09, Standard, 2700K, 1300LM, 1-10V+BLE
XIM09802720A2A	LED Module, XIM, LES09, Standard, 2700K, 2000LM, DALI
XIM09802720A3A	LED Module, XIM, LES09, Standard, 2700K, 2000LM, 1-10V
XIM09802720A5A	LED Module, XIM, LES09, Standard, 2700K, 2000LM, DALI+BLE
XIM09802720A6A	LED Module, XIM, LES09, Standard, 2700K, 2000LM, 1-10V+BLE
XIM09803007A2A	LED Module, XIM, LES09, Standard, 3000K, 700LM, DALI
XIM09803007A3A	LED Module, XIM, LES09, Standard, 3000K, 700LM, 1-10V
XIM09803007A5A	LED Module, XIM, LES09, Standard, 3000K, 700LM, DALI+BLE
XIM09803007A6A	LED Module, XIM, LES09, Standard, 3000K, 700LM, 1-10V+BLE
XIM09803013A2A	LED Module, XIM, LES09, Standard, 3000K, 1300LM, DALI
XIM09803013A3A	LED Module, XIM, LES09, Standard, 3000K, 1300LM, 1-10V
XIM09803013A5A	LED Module, XIM, LES09, Standard, 3000K, 1300LM, DALI+BLE
XIM09803013A6A	LED Module, XIM, LES09, Standard, 3000K, 1300LM, 1-10V+BLE
XIM09803020A2A	LED Module, XIM, LES09, Standard, 3000K, 2000LM, DALI

Suggested Cable Harness  
(one per unit,  
order separately)

#### **XSA-331**

XIM 6-pin 600mm  
1-10V/DALI  
Wire Harness

XIM09803020A3A	LED Module, XIM, LES09, Standard, 3000K, 2000LM, 1-10V
XIM09803020A5A	LED Module, XIM, LES09, Standard, 3000K, 2000LM, DALI+BLE
XIM09803020A6A	LED Module, XIM, LES09, Standard, 3000K, 2000LM, 1-10V+BLE
XIM09803507A2A	LED Module, XIM, LES09, Standard, 3500K, 700LM, DALI
XIM09803507A3A	LED Module, XIM, LES09, Standard, 3500K, 700LM, 1-10V
XIM09803507A5A	LED Module, XIM, LES09, Standard, 3500K, 700LM, DALI+BLE
XIM09803507A6A	LED Module, XIM, LES09, Standard, 3500K, 700LM, 1-10V+BLE
XIM09803513A2A	LED Module, XIM, LES09, Standard, 3500K, 1300LM, DALI
XIM09803513A3A	LED Module, XIM, LES09, Standard, 3500K, 1300LM, 1-10V
XIM09803513A5A	LED Module, XIM, LES09, Standard, 3500K, 1300LM, DALI+BLE
XIM09803513A6A	LED Module, XIM, LES09, Standard, 3500K, 1300LM, 1-10V+BLE
XIM09803520A2A	LED Module, XIM, LES09, Standard, 3500K, 2000LM, DALI
XIM09803520A3A	LED Module, XIM, LES09, Standard, 3500K, 2000LM, 1-10V
XIM09803520A5A	LED Module, XIM, LES09, Standard, 3500K, 2000LM, DALI+BLE
XIM09803520A6A	LED Module, XIM, LES09, Standard, 3500K, 2000LM, 1-10V+BLE
XIM09804007A2A	LED Module, XIM, LES09, Standard, 4000K, 700LM, DALI
XIM09804007A3A	LED Module, XIM, LES09, Standard, 4000K, 700LM, 1-10V
XIM09804007A5A	LED Module, XIM, LES09, Standard, 4000K, 700LM, DALI+BLE
XIM09804007A6A	LED Module, XIM, LES09, Standard, 4000K, 700LM, 1-10V+BLE
XIM09804013A2A	LED Module, XIM, LES09, Standard, 4000K, 1300LM, DALI
XIM09804013A3A	LED Module, XIM, LES09, Standard, 4000K, 1300LM, 1-10V
XIM09804013A5A	LED Module, XIM, LES09, Standard, 4000K, 1300LM, DALI+BLE
XIM09804013A6A	LED Module, XIM, LES09, Standard, 4000K, 1300LM, 1-10V+BLE
XIM09804020A2A	LED Module, XIM, LES09, Standard, 4000K, 2000LM, DALI
XIM09804020A3A	LED Module, XIM, LES09, Standard, 4000K, 2000LM, 1-10V
XIM09804020A5A	LED Module, XIM, LES09, Standard, 4000K, 2000LM, DALI+BLE
XIM09804020A6A	LED Module, XIM, LES09, Standard, 4000K, 2000LM, 1-10V+BLE

Suggested Cable Harness  
(one per unit,  
order separately)

**XSA-331**

XIM 6-pin 600mm  
1-10V/DALI  
Wire Harness

## XIM STANDARD SERIES WITH 19MM LIGHT EMITTING SURFACE (LES)

Part Number	Description
XIM19802713A2A	LED Module, XIM, LES19, Standard, 2700K, 1300LM, DALI
XIM19802713A3A	LED Module, XIM, LES19, Standard, 2700K, 1300LM, 1-10V
XIM19802713A5A	LED Module, XIM, LES19, Standard, 2700K, 1300LM, DALI+BLE
XIM19802713A6A	LED Module, XIM, LES19, Standard, 2700K, 1300LM, 1-10V+BLE
XIM19802720A2A	LED Module, XIM, LES19, Standard, 2700K, 2000LM, DALI
XIM19802720A3A	LED Module, XIM, LES19, Standard, 2700K, 2000LM, 1-10V
XIM19802720A5A	LED Module, XIM, LES19, Standard, 2700K, 2000LM, DALI+BLE
XIM19802720A6A	LED Module, XIM, LES19, Standard, 2700K, 2000LM, 1-10V+BLE
XIM19802730A2A	LED Module, XIM, LES19, Standard, 2700K, 3000LM, DALI

XIM19802730A3A	LED Module, XIM, LES19, Standard, 2700K, 3000LM, 1-10V
XIM19802730A5A	LED Module, XIM, LES19, Standard, 2700K, 3000LM, DALI+BLE
XIM19802730A6A	LED Module, XIM, LES19, Standard, 2700K, 3000LM, 1-10V+BLE
XIM19803013A2A	LED Module, XIM, LES19, Standard, 3000K, 1300LM, DALI
XIM19803013A3A	LED Module, XIM, LES19, Standard, 3000K, 1300LM, 1-10V
XIM19803013A5A	LED Module, XIM, LES19, Standard, 3000K, 1300LM, DALI+BLE
XIM19803013A6A	LED Module, XIM, LES19, Standard, 3000K, 1300LM, 1-10V+BLE
XIM19803020A2A	LED Module, XIM, LES19, Standard, 3000K, 2000LM, DALI
XIM19803020A3A	LED Module, XIM, LES19, Standard, 3000K, 2000LM, 1-10V
XIM19803020A5A	LED Module, XIM, LES19, Standard, 3000K, 2000LM, DALI+BLE
XIM19803020A6A	LED Module, XIM, LES19, Standard, 3000K, 2000LM, 1-10V+BLE
XIM19803030A2A	LED Module, XIM, LES19, Standard, 3000K, 3000LM, DALI
XIM19803030A3A	LED Module, XIM, LES19, Standard, 3000K, 3000LM, 1-10V
XIM19803030A5A	LED Module, XIM, LES19, Standard, 3000K, 3000LM, DALI+BLE
XIM19803030A6A	LED Module, XIM, LES19, Standard, 3000K, 3000LM, 1-10V+BLE
XIM19803513A2A	LED Module, XIM, LES19, Standard, 3500K, 1300LM, DALI
XIM19803513A3A	LED Module, XIM, LES19, Standard, 3500K, 1300LM, 1-10V
XIM19803513A5A	LED Module, XIM, LES19, Standard, 3500K, 1300LM, DALI+BLE
XIM19803513A6A	LED Module, XIM, LES19, Standard, 3500K, 1300LM, 1-10V+BLE
XIM19803520A2A	LED Module, XIM, LES19, Standard, 3500K, 2000LM, DALI
XIM19803520A3A	LED Module, XIM, LES19, Standard, 3500K, 2000LM, 1-10V
XIM19803520A5A	LED Module, XIM, LES19, Standard, 3500K, 2000LM, DALI+BLE
XIM19803520A6A	LED Module, XIM, LES19, Standard, 3500K, 2000LM, 1-10V+BLE
XIM19803530A2A	LED Module, XIM, LES19, Standard, 3500K, 3000LM, DALI
XIM19803530A3A	LED Module, XIM, LES19, Standard, 3500K, 3000LM, 1-10V
XIM19803530A5A	LED Module, XIM, LES19, Standard, 3500K, 3000LM, DALI+BLE
XIM19803530A6A	LED Module, XIM, LES19, Standard, 3500K, 3000LM, 1-10V+BLE
XIM19804013A2A	LED Module, XIM, LES19, Standard, 4000K, 1300LM, DALI
XIM19804013A3A	LED Module, XIM, LES19, Standard, 4000K, 1300LM, 1-10V
XIM19804013A5A	LED Module, XIM, LES19, Standard, 4000K, 1300LM, DALI+BLE
XIM19804013A6A	LED Module, XIM, LES19, Standard, 4000K, 1300LM, 1-10V+BLE
XIM19804020A2A	LED Module, XIM, LES19, Standard, 4000K, 2000LM, DALI
XIM19804020A3A	LED Module, XIM, LES19, Standard, 4000K, 2000LM, 1-10V
XIM19804020A5A	LED Module, XIM, LES19, Standard, 4000K, 2000LM, DALI+BLE
XIM19804020A6A	LED Module, XIM, LES19, Standard, 4000K, 2000LM, 1-10V+BLE
XIM19804030A2A	LED Module, XIM, LES19, Standard, 4000K, 3000LM, DALI
XIM19804030A3A	LED Module, XIM, LES19, Standard, 4000K, 3000LM, 1-10V
XIM19804030A5A	LED Module, XIM, LES19, Standard, 4000K, 3000LM, DALI+BLE
XIM19804030A6A	LED Module, XIM, LES19, Standard, 4000K, 3000LM, 1-10V+BLE

Suggested Cable Harness  
(one per unit,  
order separately)

**XSA-331**

XIM 6-pin 600mm  
1-10V/DALI  
Wire Harness

## MECHANICAL CHARACTERISTICS

### MECHANICAL SPECIFICATIONS

Dimensions:	<p>Ø 50mm x 20mm (1.97" x 0.78")</p> <p>* Xicato recommends an insertion space of Ø 52mm</p>
Weight:	48 grams (1.69 oz.)
Module Source Type:	Corrected Cold Phosphor Technology®
Module Housing:	Injection molded glass filled PBT
Light Emitting Surface options:	<p>Ø 9mm (0.35")</p> <p>Ø 19mm (0.75")</p>
Interfaces: Electrical	<p>6-Pin terminal. TE part # 353908-6P. Mating connector TE 353907-1.</p> <p>Pin-out: P1 + power, P2 - power, P3 open, P4 open, P5 control+, P6 control-.</p> <p>600mm wire harness accessory available through Avnet (part #2829114-2), Xicato Part # XSA-331.</p>
Interfaces: Mechanical	Recommended mounting screws: M3 x 0.5mm x 25mm with split lock washer.
Mounting Torque:	Min: 0.36N-m (3.2in-lbs). Max: 0.43N-m (3.8in-lbs)
Interface: Thermal	Integrated thermal pad. A mating thermal interface (i.e. heatsink) surface flatness of $\leq 0.1$ mm and center hole less than Ø12 mm is recommended in order to maintain thermal performance.
Maximum Case Temperature:	90°C
Shipping (20 pc MOQ):	<p>20 count box: 347mm x 230mm x 9mm (14" x 9" x 4"), 1.4 kg (3 lbs.) gross weight</p> <p>100 count box: 533mm x 254mm x 153mm (21" x 10" x 6"), 3 kg (7 lbs.) gross weight</p>
Storage Temperature:	-40°C to +85°C
Ingress Protection:	IP20



XIM 9mm



XIM 9mm top



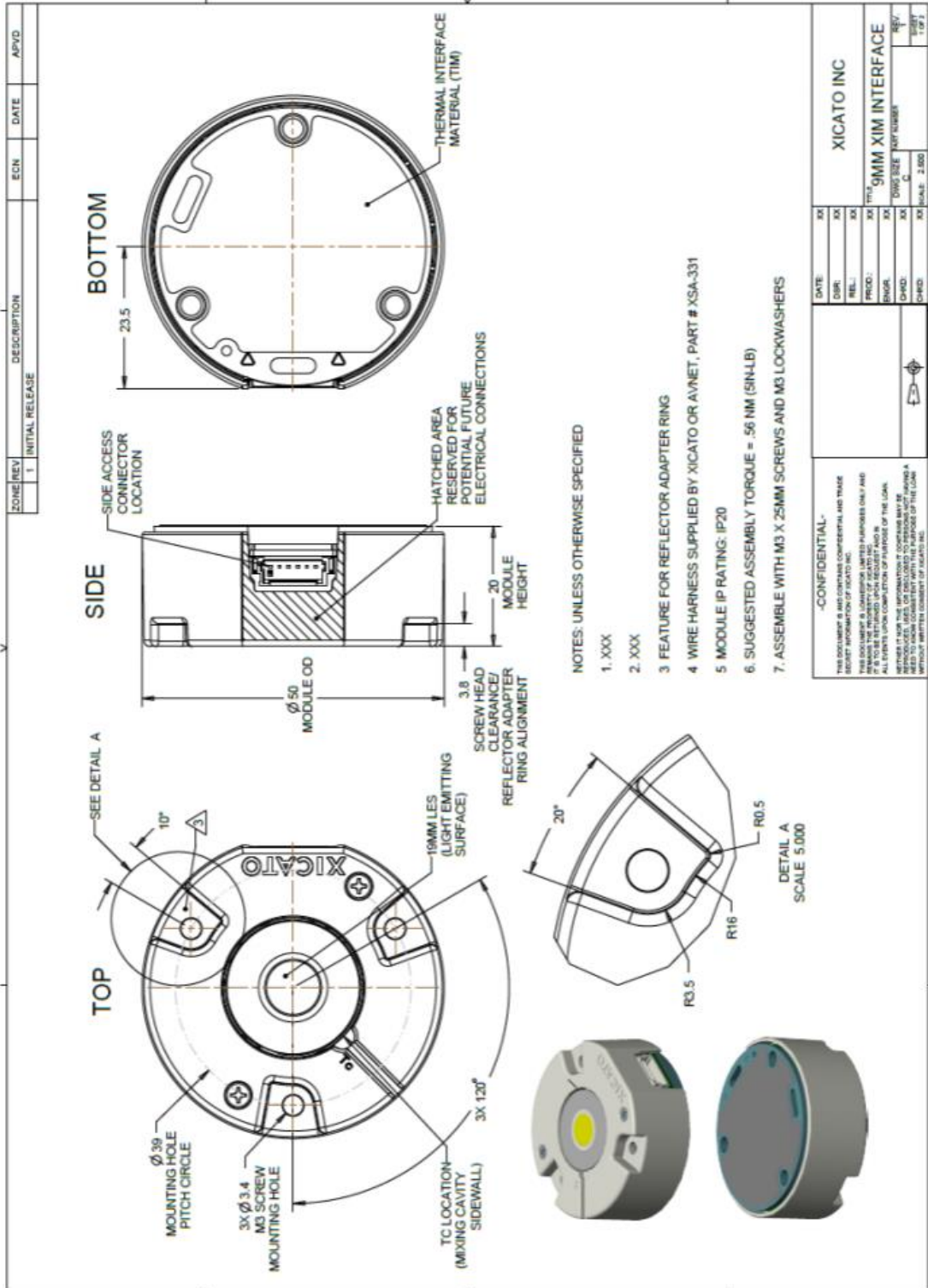
XIM 19mm



XIM 19mm top

## MECHANICAL DRAWINGS

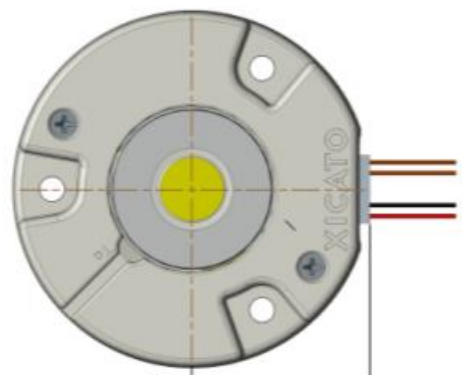
NOTE: XIM 19mm is identical except for the diameter of the light emitting surface (19mm vs. 9mm)



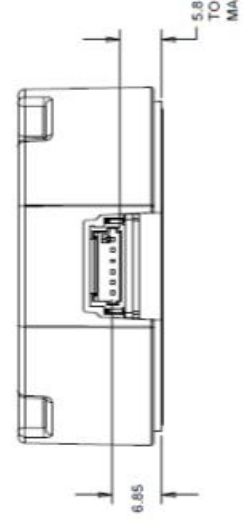


ZONE/REV	DESCRIPTION	ECN	DATE	APVD

## XIMCV SIDE ACCESS DETAIL 6 PIN MINI CT CONNECTOR



XIM-CV PIN OUT					
PIN#	WIRE COLOR	FUNCTION	AWG	RATING	LENGTH
1	RED	+48V POWER	24 (1.12 MM MAX INULATION OD)	1200mA	600 MM
2	BLACK	-48V POWER	24 (1.12 MM MAX INULATION OD)	1200mA	600 MM
3	DNU	XICATO RESERVED	N/A	N/A	N/A
4	DNU	XICATO RESERVED	N/A	N/A	N/A
5	VIOLET	1-10V DIM +	24 (1.12 MM MAX INULATION OD)	50V 250mA	600 MM
		DALI CONTROL 1			
6	GREY	1-10V DIM -	24 (1.12 MM MAX INULATION OD)	50V 250mA	600 MM
		DALI CONTROL 2			



-CONFIDENTIAL-		DATE		XX	XICATO INC
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		PROD:		XX	9MM XIM INTERFACE
		DRAW:		XX	
		DMS:		XX	DWG DSC
		DMD:		XX	REV C
		DMD:		XX	REV NUMBER
		DMD:		XX	REV
		DMD:		XX	TOP
		DMD:		XX	2 EDC

## ELECTRICAL & DIMMING CHARACTERISTICS

Module Electronics Lifetime 5,400,000 hrs MTBF calculated @ 90°C, 0.6 CL, per Telcordia SR-332 Issue 3  
 Power in Off State (XIM Gen4) DALI+BLE (A5A): 270mW, 1-10V+BLE (A6A): 380mW

### OVER TEMPERATURE PROTECTION

Fold Back Temperature 93°C (reduces to 85% of set level)  
 Shut-off Temperature 98°C  
 Restore Temperature 85°C (increases back to 100% of set level)

### DIMMING INFORMATION: ALL PROTOCOLS

Dim to Off (0%) Yes  
 On/off threshold ≤ 0.05% of module maximum rated intensity. Subject to change.

### DIMMING INFORMATION: BLUETOOTH SMART

Dimming Profile Logarithmic (default) or linear, configurable  
 Minimum Dim Setting 0.1% of maximum intensity  
 Dimming Granularity 0.01% resolution (10,000 steps from 100% to 0.01%)

### DIMMING INFORMATION: DALI (IEC 62386-101/102:2009 AND IEC 62386-207)

Dimming Profile Logarithmic (default) or linear, configurable  
 Minimum Dim Setting 0.1% of maximum intensity  
 Dimming Granularity 255 steps  
 Dimming Compatibility DALI 1.0. Additional compatibility information available at [www.xicato.com](http://www.xicato.com)

### DIMMING INFORMATION: 1-10V / 0-10V (IEC 60929 ANNEX E)

Dimming Profile	< 0.5V	0% (off) (> 0.75V to turn back on)
	≥ 0.5V and < 1.0V	1%
	≥ 1.0V and < 9.0V	$12.375\% \times (V_{1-10V} - 1) + 1\%$
	≥ 9.0V	100%

Dimming Compatibility XIM is compatible with a wide range of 1-10V sink dimming systems. Refer to dimming compatibility documentation at [www.xicato.com](http://www.xicato.com).

Potentiometer Compatibility 100kOhm typical

### DIMMING AND FLICKER

Reference	Luminous Intensity	Modulation Frequency	Risk Level
Reference IEEE Std 1789-2015: "IEEE Recommended Practices for Modulating Current in High-Brightness LEDs for Mitigating Health Risks to Viewers"	100% - 1.25% of max	≥ 3,000 Hz	No Effect
	1.25% - 0.5% of max	≥ 1,250 Hz	Low Risk
	0.5% - 0.1% of max	< 1,250 Hz	Medium Risk

## XIM WARRANTY

Warranty duration:	Verifiable 7 years or 50,000 hours of operation at luminous intensity > 0%. Verification based on actual operating data stored in each module.
Warranty coverage:	Covers initial color consistency, lumen maintenance, color maintenance, and drive electronics on EVERY module (B0). No failures.
Initial Color Consistency:	Every light source is within 1x2 MacAdam Ellipse (1x2 SDCM) of target color point. Flux and color point tuned at case temperature 70°C.
Lumen Maintenance:	Better than 70% (L70, B0, F0) at 50,000 hours at maximum operating drive current and maximum case temperature (90°C).
Color Maintenance:	Luminaires within a contiguous space shall remain within $\pm 0.003 \Delta u'v'$ of each other at maximum case temperature (90°C) for the duration of the warranty.
Full warranty text at:	<a href="http://www.xicato.com/support/warranty">www.xicato.com/support/warranty</a>

## INITIAL COLOR CONSISTENCY – DETAILS

### NOTES:

1. Artist Series and Standard Series color point targets are on the Planckian locus at each specified CCT
2. Vibrant Series color point target is -0.003 Duv
3. Beauty Series color point target is -0.006 Duv
4. All metrics are calculated according to the proprietary Xicato color matching function

Correlated Color Temp		Initial Color Consistency		
Nominal	Actual	CCT	Duv	SDCM
<b>2700K</b>	2700K	$\pm 40K$		
<b>3000K</b>	2950K	$\pm 50K$	$\pm 0.001$	$\pm 1x2$
<b>3500K</b>	3420K	$\pm 60K$		
<b>4000K</b>	4000K	$\pm 70K$		

## COLOR METRICS: STANDARD SERIES

Optimized for excellent, natural color rendition with high efficiency.

All color rendering data at highest rated drive current and 70°C case temperature ( $T_c$ )

Tester consistency (reproducibility)  $\pm 0.0002$  Duv (CIE 1964) from NIST reference

Correlated Color Temperature: 2700K, 3000K, 3500K, or 4000K nominal  
3000K used as test reference.

Initial Color Consistency:  $\leq 1 \times 2$  Macadam ellipses (SDCM) at 70°C, B0

CIE CRI Minimums:  $R_s \geq 80, R_9 \geq 0$

Color Maintenance: Consistency maintained  $< 0.003 \Delta u'v'$  at 50,000 hours

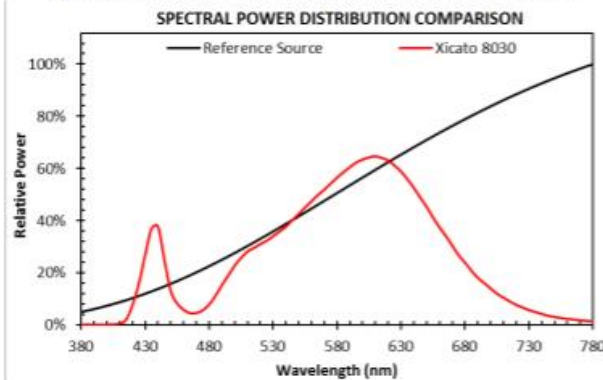
Lumen Maintenance: L70/B0 at 50,000 hours

Warranty: Verifiable 7 years or 50,000 hours for individual modules (B0) on mortality, color and lumen maintenance (XIM only). Details at [www.xicato.com/support/warranty](http://www.xicato.com/support/warranty)

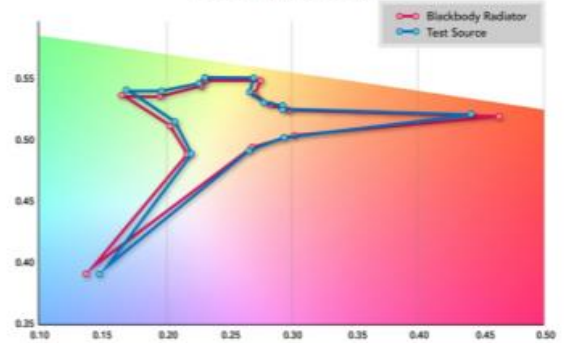
### CIE CRI COLOR METRICS (VALUES ARE TYPICAL)

	Ra	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15	GA <sub>BB</sub>
Standard Series	83	80	88	95	81	80	85	85	63	14	73	80	70	81	97	74	96

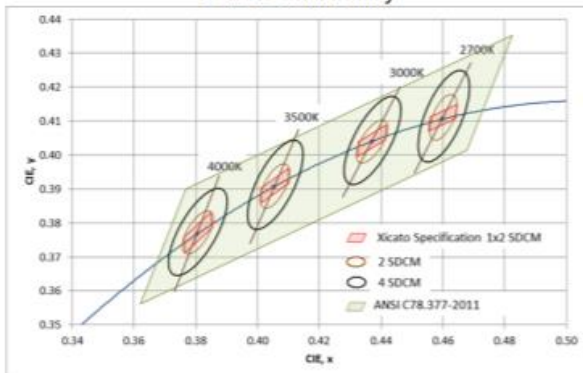
Spectral Power Distribution vs. Reference Source



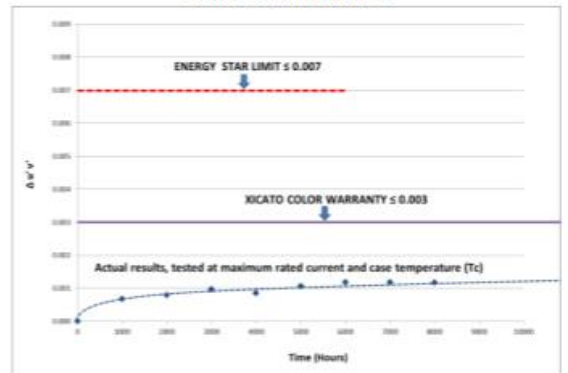
CIE Color Gamut



Color Consistency



Color Maintenance



## IES TM-30 COLOR METRICS

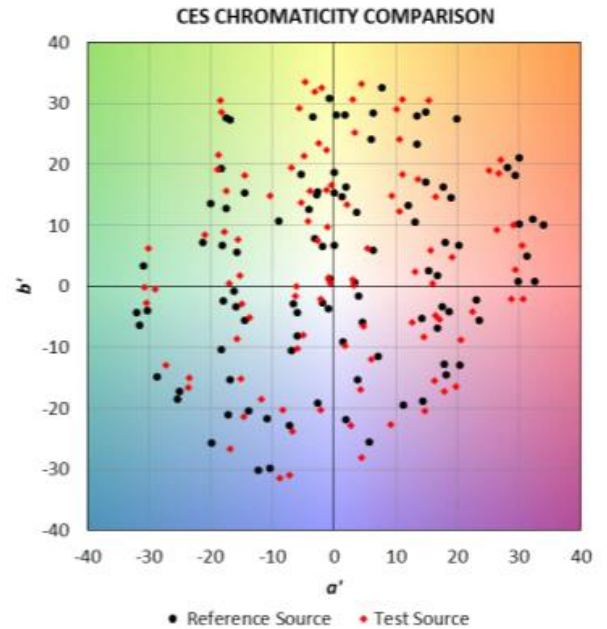
(Values are typical. Based on 3000K CCT)

IES TM-30 Color Fidelity ( $R_f$ ) 78

IES TM-30 Color Gamut ( $R_g$ ) 101

## CES CHROMATICITY COMPARISON

This plot shows the shift in chromaticity for each individual color evaluation sample (CES). Closer proximity between paired dots indicates higher fidelity.

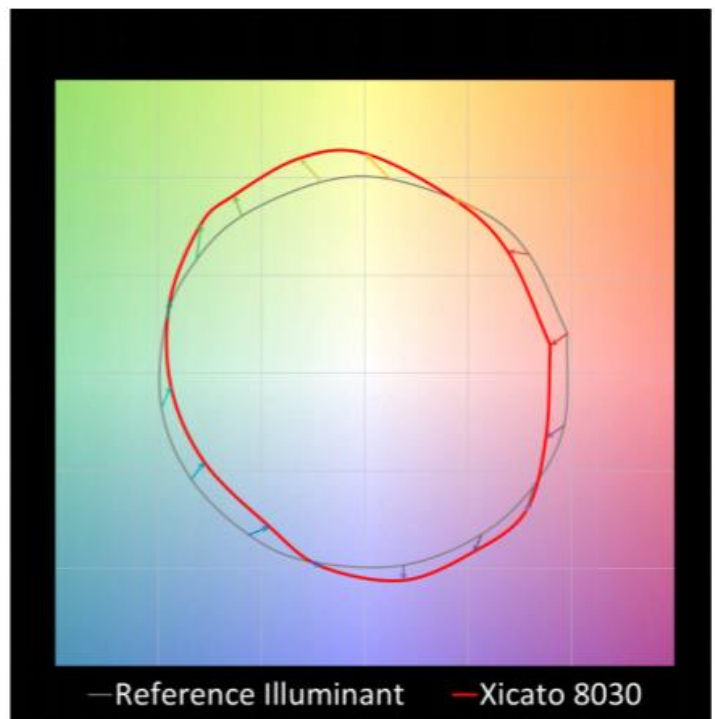


## COLOR VECTOR GRAPHIC

This plot shows the average chromaticity shift for the samples within each of 16 hue bins, which are compiled out of the 99 IES TM-30 Color Evaluation Samples. The values are normalized so that the reference is a circle.

Vector arrows indicate the direction and degree of the shift for each hue bin.

- Radial shift indicates an increase/decrease in saturation.
- Tangential shift indicates a shift in hue.
- Length of arrow indicates degree of shift.

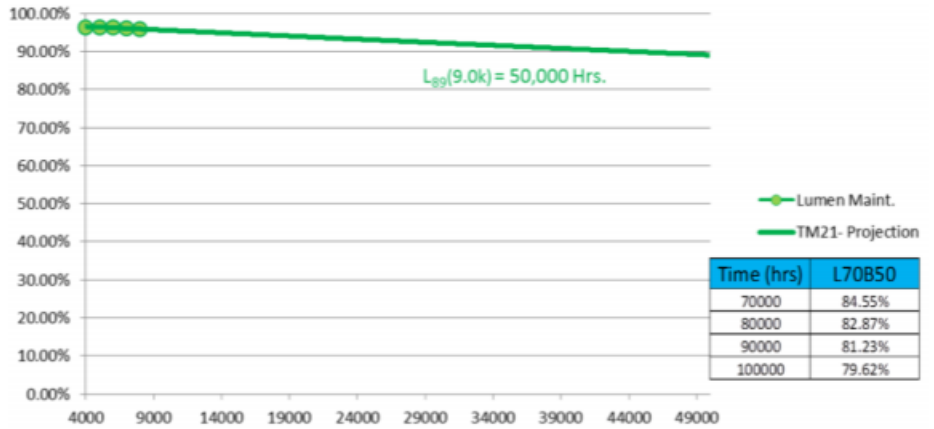


## IES LM-80

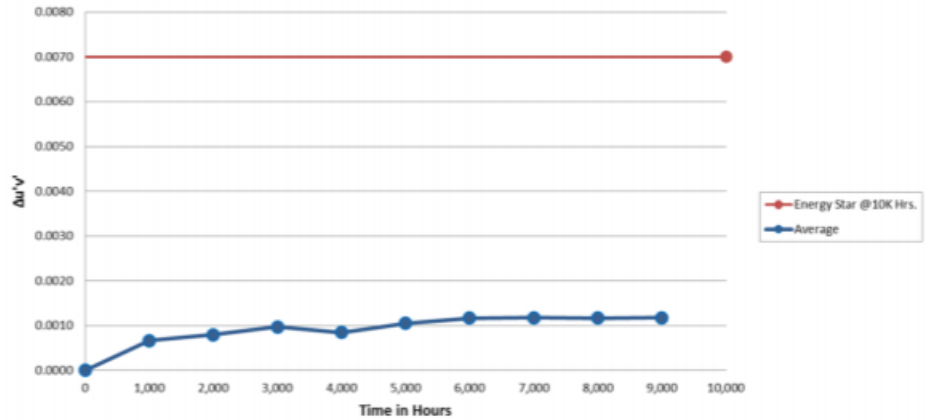
STANDARD SERIES, 19MM, 3000K, 3000 LUMENS

Testing conducted at BAFL.  $T_c = 90^\circ\text{C}$ ,  $I_f = 1050\text{mA}$ , HTOL, 8000 Hrs.

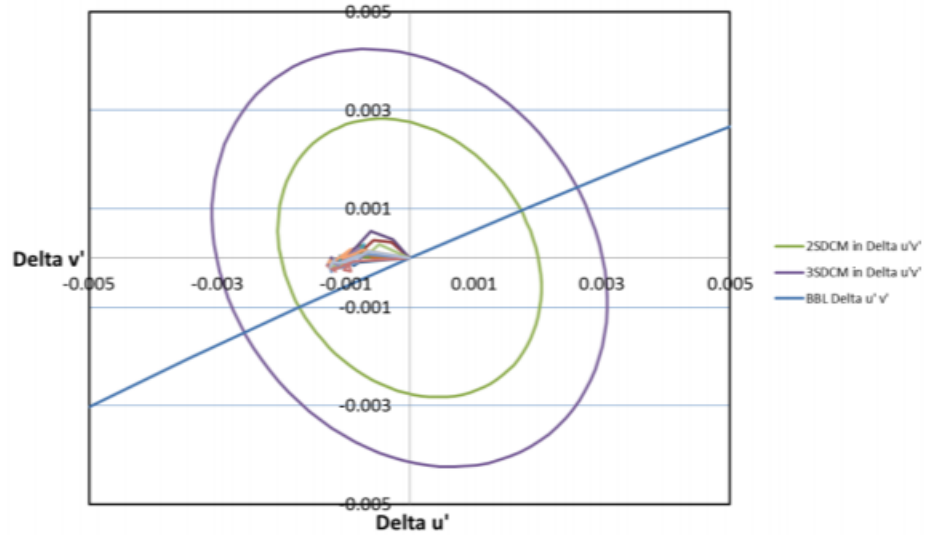
### LUMEN MAINTENANCE



### COLOR MAINTENANCE



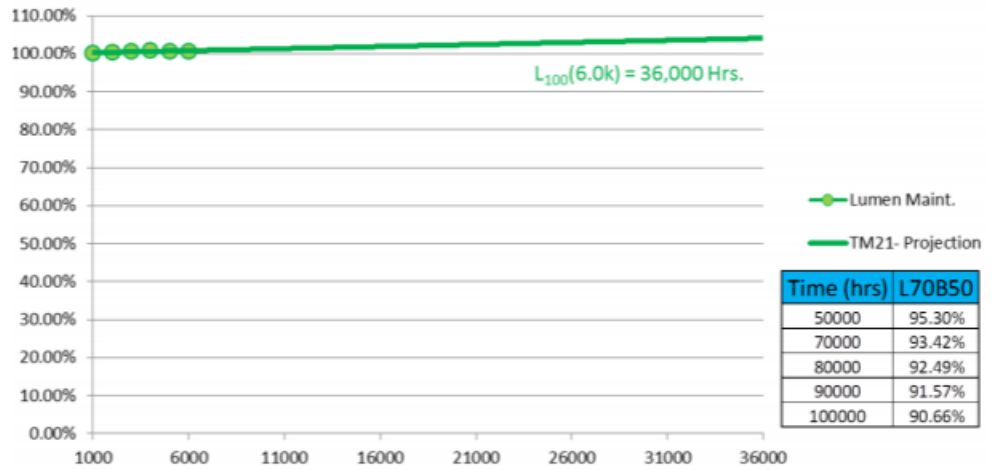
### COLOR MAINTENANCE (NORMALIZED)



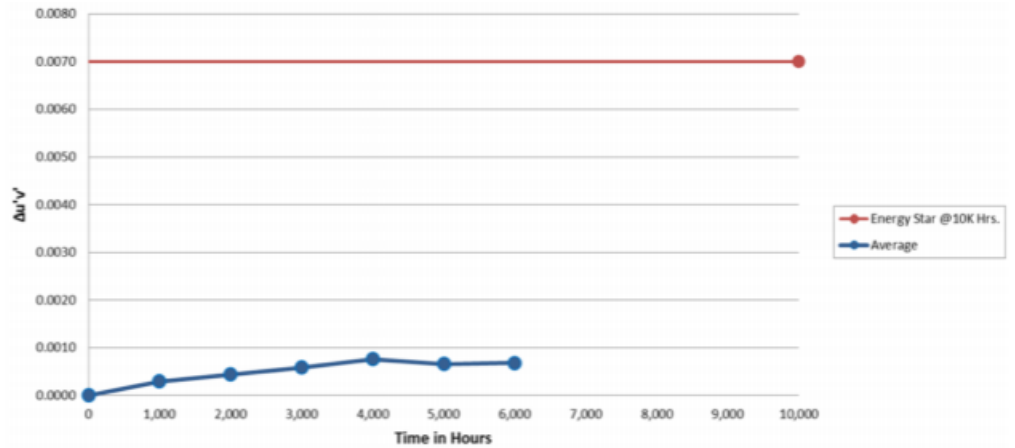
## STANDARD SERIES, 19MM, 3000K, 5000 LUMENS

Testing conducted at BACL  $T_c = 90^\circ\text{C}$ ,  $I_f = 1400\text{mA}$ , HTOL, 6000 Hrs.

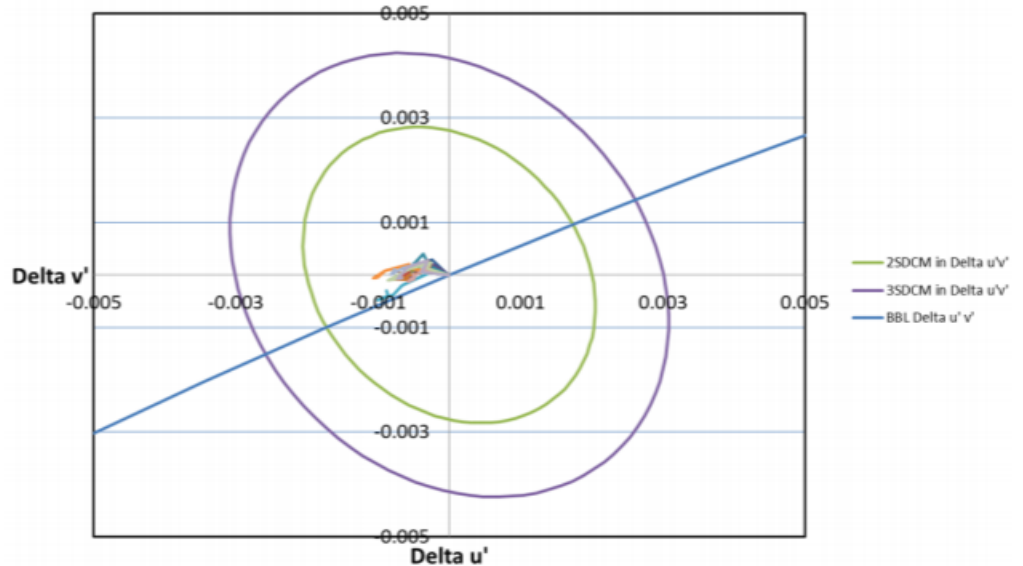
### LUMEN MAINTENANCE



### COLOR MAINTENANCE



### COLOR MAINTENANCE (NORMALIZED)



## POWER AND EFFICACY VS. INTENSITY

Note that the XIM with Bluetooth consumes a small amount of power due to its periodic wireless transmissions of operating data. Power shown at 0% is worst-case, based on full power and high frequency transmission, which is configurable.

Power in W	100%	75%	50%	24%	10%	5%	1%	0%
<b>Efficacy in Lm/W</b>								
XIM0980xx07A5A	9.5	6.9	4.5	2.4	1.1	0.69	0.35	0.27
Efficacy (typ)	73	76	77	73	64	51	20	NA
XIM0980xx07A6A	9.6	7.0	4.7	2.5	1.2	0.80	0.46	0.38
Efficacy (typ)	73	75	75	70	58	44	15	NA
XIM0980xx13A5A	17.8	12.7	8.2	4.2	1.8	1.05	0.43	0.27
Efficacy (typ)	73	77	79	78	72	62	30	NA
XIM0980xx13A6A	17.9	12.9	8.3	4.3	1.9	1.2	0.54	0.38
Efficacy (typ)	72	76	78	76	68	56	24	NA
XIM0980xx20A5A	33.6	22.9	14.1	6.8	2.9	1.6	0.54	0.27
Efficacy (typ)	59	66	71	74	70	64	37	NA
XIM0980xx20A6A	33.8	23.0	14.3	6.9	3.0	1.7	0.65	0.38
Efficacy (typ)	59	65	70	72	67	60	31	NA
XIM1980xx13A5A	11.9	8.6	5.7	3.0	1.3	0.81	0.38	0.27
Efficacy (typ)	110	113	115	109	97	81	34	NA
XIM1980xx13A6A	12.0	8.7	5.8	3.1	1.5	0.92	0.49	0.38
Efficacy (typ)	108	112	112	105	89	71	27	NA
XIM1980xx20A5A	18.1	13.0	8.5	4.3	1.9	1.1	0.43	0.27
Efficacy (typ)	111	115	118	115	107	93	46	NA
XIM1980xx20A6A	18.2	13.1	8.6	4.5	2.0	1.2	0.54	0.38
Efficacy (typ)	110	114	117	112	101	85	37	NA
XIM1980xx30A5A	29.8	21.1	13.5	6.7	2.9	1.6	0.53	0.27
Efficacy (typ)	101	107	111	111	105	96	56	NA
XIM1980xx30A6A	29.9	21.2	13.6	6.9	3.0	1.7	0.64	0.38
Efficacy (typ)	100	106	111	109	101	90	47	NA

## PERFORMANCE GRAPHS

The latest graphs of XIM flux, CCT, and efficacy performance at different intensity and case temperature levels are available on Xicato website under Support / Documents and Tools.

- (1) In the "Choose a category" pull down menu, select "datasheets".
- (2) In the "Choose a product" pull down menu, select "XIM Generation 4".