

	<b>Technical Specification Sheet 190</b>	<b>Version</b>
		<b>1.0</b>

### Revision History

Version	Change Details	Originator	Checker (IPL)	Checker (QPL)	Approver (DQM)	Approver (R&D Mgr.)	Release Date
1.0	Initial release	Ronnie HU	Ronnie HU				

### 1. Product list

Product Name	12 NC	Product Description	Product Region
W21/5 6000k	9237.954.17801	W21/5 LED white 11066 XUW X2	EMEA

### 2. Purpose

To replace main part of current X-treme Ultinon platform with cost-down version. Performance is compatible with main competitors. T20 and T16 are included.

### 3. Scope

W21/5 White is included in this file.

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1. GENERAL REQUIREMENTS		
Commercial type	W21/5 White	
Application	Daylight lighting	
Rated Power (typical) <FF>	12V: 1.8W/0.3W; 24V: 2.3W/0.5W	
Rated Voltage (range)	12V & 24V ( 9~32V)	
Rated Frequency (range)	DC input	
Rated Current (max./range) <FF>	12V:135mA/20mA; 24V: 85mA/17mA	
Rated Lumen (typical) <FF>	12V: Major : 240lm +/-20% (1min) 230lm +/-20% (30mins) Minor: 40lm +/-20% (1min) 40lm +/-20% (30mins)	24V: Major : 265lm +/-20% (1min) 250lm +/-20% (30mins) Minor: 50lm +/-20% (1min) 50lm +/-20% (30mins)
Lamp Base	W3 x 16q	
Lamp Type (size)	Ø20.2 x 45.2 mm	
Rated CCT <FF>	6500 +/- 500K (50% product above 6000K, 6000K on package)	
MOL (max)	45.5mm	
MOD (max)	Ø20.5mm	
Weight (max)	8.2g	
Rated Lifetime (L70Tc * @25°C)	3000hrs	
Dimmability	No	
Approbation	ELV/ RoHS, REACH, PVC free, waiver BFR free	

2. ELECTRICAL SPECIFICATION				
Name	Value	Unit	Tolerance	Remarks
Voltage	12 & 24V	V	9~32	
Current	0.130/0.020	A	±15%	@ 13.5V 25°C
	0.85/0.017	A	±15%	@ 28V 25°C
Power	1.8/0.3	W	±15%	@ 13.5V 25°C
	2.3/0.5	W	±15%	@ 28V 25°C

3. PHOTOMETRICAL AND COLOR SPECIFICATION				
Name	Value	Unit	Tolerance	Remarks
Beam angle	NA	degree	±3	

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### 3. PHOTOMETRICAL AND COLOR SPECIFICATION

Name	Value	Unit	Tolerance	Remarks	
Lumen output	Major: 240/230	lm	Typ.	13.5V @ 1min/@30min	
	Minor: 40/40	lm			
	Major: 288/276	lm	Max.		
	Minor: 48/48	lm			
	Major: 192/184	lm	Min.		
	Minor: 32/32	lm			
		Major: 265/250	lm	Typ.	28 @ 1min/@30min
		Minor: 50/50	lm		
		Major: 318/300	lm	Max.	
		Minor: 60/60	lm		
		Major: 212/200	lm	Min.	
		Minor: 40/40	lm		
Lumen efficacy	141	lm/W	Typ.	13.5V @ 1min	
	98	lm/W	Typ.	28V @ 1min	
Color Characteristics CCT	6500 +/-500	k	-	(1)+/-150k ( same color bin, Inside same pair product) (2)+/-300k (2~3 close color bin, Inside same batch) (3)+/-500k ( full color bin, Between different batches )	

All the items are tested according to CIE-127-2007

### 4. RELIABILITY REQUIREMENTS

Name	Value	Unit	Tolerance	Remarks
Lifetime (L70 Tc @25°C)	3000	hour	Typ.	L70 TC means the time when 63.2% bulbs lumen decrease to 70% of original

RELIABILITY REQUIREMENTS		Acceptance criteria
Mechanical vibration test	IEC 60180 B.4 table	The DUT must be fully functional before, during and after the test, and all parameters must meet the specifications.
Low temperature storage	refer to B.3 table parameter	Visual check, electrical check and function check is minimum C after 2hrs reaching room temperature 1st step is 24hrs storage for PF; 2nd step to continue to 1000hrs (follow OEM requirement) and update the status in CA/CR/MPR

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RELIABILITY REQUIREMENTS		Acceptance criteria
Low temperature operation	from Trm to Tmin: 25C to -40°C the transition <=1K/min (IEC60068-2-2B) operation mode: 1.1 time from -40C to 25C depend on oven ability (no specify)	Visual check, electrical check and function check is minimum C after 2hrs reaching room temperature 1st step is 24hrs storage for PF; 2nd step to continue to 1000hrs (follow OEM requirement) and update the status in CA/CR/MPR
High temperature storage	at a temperature of 85 °C unless otherwise specified in the DUT specification The operating mode of the DUT is 1.1	Visual check, electrical check and function check, lumen decay <30% after 2hrs reaching room temperature 1st step is 48hrs storage for PF; 2nd step to continue to 1000hrs (follow OEM requirement) and update the status in CA/CR/MPR
Climatic sequence	Initial test first, then Temperature = -10°C ~65°C Humidity = RH 80~96%. Status : 5.5hrs ON, 2hrs OFF, 7.5hrs ON, 2hrs OFF, 3.5hrs ON, 3.5hrs OFF, 3hrs ON as 1 cycle total test: 10 cycles 240hrs	after the test, lumen decay < 30%
Room Temperature Operating Life (RTOL)	13.5V/ambient (25°C) 1. test to 2000hr or claimed value which ever longer; 3. Continue test to fail at discursion of reliability data analyst. Default decision continue. ON /OFF : 45min on 15min off	1. test to claimed value, goal is all samples decay <30% (L70Tc). In case that samples do not pass full 8D must be done including corrective action. 3. test to fail, Record failure mode and FA
High temperature operating Life (HTOL ON) ( 75C)	13.5V/75°C, 28V/75°C for 380hr;	1) Test to 380hrs, all samples lumen decay <30%, within initial color and electrical specification (L70) while keep updating the status during reporting point
thermal shock test	thermal shock test	thermal shock test
Accelerated Wet High temperature operating Life (WHTOL ON)	13.5V/65°C/85%RH, 28V/65°C/85%RH for 380hrs	1) Test to targethrs, all samples lumen decay <30%, (L70) pass PF
Free fall test	– number of DUT: 3; – falls per DUT: 2; – drop height: 1 m free fall or the height of handling in accordance with agreement; – impact surface: concrete ground or steel plate; – orientation of the DUT: 1st fall of each DUT at a different dimensional axis; 2nd fall with the given DUT at the same dimensional axis, but on the opposite side of the housing; – operating mode of the DUT: 1.1 (see ISO 16750-1); – temperature: shall be agreed between customer and supplier.	– The DUT shall be visually examined after the falls. – Hidden damage is not permitted. – Minor damage of the housing is permitted as long as this does not affect the performance of the DUT. – Proper performance shall be proven following the test.  Functional status shall be class C as defined in ISO 16750-1.

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RELIABILITY REQUIREMENTS		Acceptance criteria
Temperature Equivalent $\Delta t_{eq}$	rated voltage, burn in 1hrs, test $T_j$	$T_j < \text{Max. of LED}$
Lamp base temperature test (benchmark to HAL)	checking the temperature of base in socket burning 30min	comparable to hall lamp

5. SAFETY, EMC, RF REQUIREMENTS	
Name	Description
IP level	No requirement
Lamp dimension	$\varnothing 20.2 \times 45.2 \text{ mm}$
OTP close	Y
EMC compliance	ECE R10
Beam Pattern	Y

6. ENVIRONMENTAL REQUIREMENTS		
Name	Description	Applicable Yes/No?
ELV	2000_53_E ELV	Y
China auto RoHS	GB/T 30512-2014	Y
Energystar Toxics Reduction	ENERGY STAR® Program Requirements Product Specification for Lamps (Light Bulbs) Version 1.0	N/A
REACH	European Directive 1907/2006/EC	Y
PVC free	Philips internal standard (RSL)	Y
Other hazardous substances (BFR free, etc)	Philips internal standard (RSL)	Y with waiver
Dust density requirement	N/A	N