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DESCRIPTION

The LXMG221W-0700034-D0 is a fully enclosed compact solid-state LED lighting driver module. It operates from a universal AC input supply in the range of 100V_{AC} to 277V_{AC}, 50/60Hz to drive a string of LEDs with active power factor correction. LED string voltage can range from 14V to 48V at a constant current of 700mA to drive a wide variety of LED lamp string requirements.

Control terminal leads include a dimming input BRITE_A with a dedicated RETURN lead. The amplitude of the output LED string current will vary from 10% to 100% corresponding to a 1V_{DC} to 10V_{DC} signal on the BRITE_A input following the 0V to 10V ESTA E1.3-2001 Analog Control Specification Standard. The BRITE_A terminal when pulled down below minimum dimming will turn off the LEDs and enter a low power consumption mode.

To reduce audible noise the internal switching frequency remains above 30kHz. Safety features include open output circuit protection, whole string short circuit protection. The maximum allowable hot spot case temperature is 90°C (above this temperature the module will be thermally self-protected). The recommended operating ambient temperature range is -30°C to 70°C, as long as the maximum case temperature is not exceeded. The compact enclosure is rated to IP66, meets UL8750 and UL1310 class 2, CE pending.

KEY FEATURES

- High Efficiency (90%)
- Active Power Factor Correction (Typical 0.99 at 120V_{AC})
- Universal AC Input 100~277V_{AC}
- Constant Current 700mA Typical Output
- Anode Supply Adjusts for String Voltage between 14V and 48V
- Dimming Input Provides 10% to 100% Range, Plus Shutdown
- Small Compact Size With a Hole in the Middle for Easier Mounting and Wiring
- Fully Isolated Plastic Case (IP66)
- Long Life Expectancy
- Full Protection: OVP, SCP, OTP, Maximum Power Limit
- Complies with UL8750 & UL1310 (File E337545)
- FCC Class B & CE Pending
- RoHS Compliant

APPLICATIONS

Worldwide Residential and Commercial LED Lighting Fixtures such as:

- LED Down Lights
- LED Street Lights

IMPORTANT: For the most current data, consult MICROSEMI's website: <http://www.microsemi.com>
Patents Pending

PRODUCT HIGHLIGHT

ORDER INFORMATION

Part Number	Input Voltage	Output Current
LXMG221W-0700034-D0	100V _{AC} to 277V _{AC} 50/60Hz	700mA Dimmable Current Source 14V to 48V Anode Voltage



ABSOLUTE MAXIMUM RATINGS

Input Voltage (V_{IN}).....	90 V_{AC} to 305 V_{AC}
Input Frequency (V_{IN}).....	47 to 63Hz
Input Power	40W
Output LED String Current	800mA (Internally Limited)
Output String Voltage	52V (Internally Limited)
Output Power	38W (Internally Limited)
Input Signal Voltage (BRITE_A Input).....	-0.3V to 52V
Cold Start Temperature.....	-30°C
Hot Spot Case Temperature, zero airflow	90°C
Storage Temperature Range	-40°C to 85°C

Note: Exceeding these ratings could cause damage to the device. All voltages are with respect to Ground. Currents are positive into, negative out of specified terminal.

RECOMMENDED OPERATING CONDITIONS (R.C.)

This module has been designed to operate over a wide range of input and output conditions. However, best efficiency and performance will be obtained if the module is operated under the condition listed in the 'R.C.' column. Min. and Max. columns indicate values beyond which the inverter, although operational, might not function optimally.

Parameter	Symbol	Min	R.C.	Max	Units
Input Supply Voltage Range	V_{IN}	100		277	V_{AC}
Linear BRITE_A Control Input Voltage Range	V_{BRITE_A}	0		10	V
Linear BRITE_A Control PWM Frequency Range (Open Collector)	V_{BRITE_PWM}	0.2		10	kHz
Linear BRITE_A Control PWM Amplitude Range (Totem Pole)	V_{BRITE_PWM}	10		52	V
Linear BRITE_A Control PWM Frequency Range (Totem Pole)	V_{BRITE_PWM}	0.2		25	kHz
Linear BRITE_A Control PWM Duty Cycle Range	V_{BRITE_DC}	9.5		100	%
LED String Voltage	V_{LED}	14		48	V
OUT(-) Sink Current	OUT- I_{SINK}		700		mA
Maximum Allowable Case Temperature	T_C			90	°C
Cold Start Temperature	T_{COLD}	-30			°C

ELECTRICAL CHARACTERISTICS

Unless otherwise specified, the following specifications apply over the recommended operating condition except where otherwise noted; $V_{IN} = 90 V_{AC}$ to 305 V_{AC} ; BRITE_A = 8k Ω to RETURN; Full Load condition is 48V/700mA unless otherwise noted

Parameter	Symbol	Test Conditions / Comment	Min	Typ	Max	Units
Input Voltage	V_{IN}	Line Frequency 47 to 63 Hz	90		305	V_{AC}
Off Power	$P_{IN(MIN)}$	BRITE_A \leq 0.5V, $V_{IN} = 120V_{AC}$		0.3		W
Input AC Current	I_{120}	Measured at Full Load and 120 V_{AC} Input		0.31		A
	I_{277}	Measured at Full Load and 277 V_{AC} Input		0.14		A
Maximum Inrush Current	I_{INRUSH}	Measure at 277 V_{AC} Peak AC Line; Maximum Duration 10 μ s			60	A
		Measure at 277 V_{AC} Peak AC Line Measured after 10 μ s			5	A



ELECTRICAL CHARACTERISTICS

Unless otherwise specified, the following specifications apply over the recommended operating condition except where otherwise noted; $V_{IN} = 90 V_{AC}$ to $305V_{AC}$; $BRITE_A = 8k\Omega$ to RETURN; Full Load condition is $48V/700mA$ unless otherwise noted

Parameter	Symbol	Test Conditions / Comment	Min	Typ	Max	Units
Power Factor		Full Load, $100V_{AC}$ to $277V_{AC}$	0.9			PF
Peak Efficiency	η	Full Load, $V_{LED} = 48V$		90		%
Efficiency	η	Full Load, $V_{LED} = 48V$, $V_{IN} = 120V_{AC}$	88	89		%
Total Harmonic Distortion	THD	Full load, $100V_{AC}$ to $277V_{AC}$			10	%

OUTPUTS

Average Sink Current	I_{OUT-}	$T_A = 25^\circ C$	665	700	735	mA
LED String Voltage	V_{LED}	Rated LED current	14		48	V
Ripple (pk-pk)	$I_{OUT-RIPPLE}$	Full Load, $V_{LED} = 48V$, (pk to pk)/Average			20	%
Line Regulation	$I_{OUT-LINE}$	$V_{IN} = \text{Nominal} \pm 10\%$ (i.e. $120V_{AC} \pm 10\%$)			1	%
Load Regulation	$I_{OUT-LOAD}$	OUT(+) 14V to 48V		1	4	%
Turn-on Time	DELAY	Cold Start, Power ON		1		Sec
Output Overshoot / Undershoot	$I_{OUTSHOOT}$	Turning Power On or Off			10	%

Dimming

BRITE_A Voltage for Full Bright	$V_{BRITE_A_MAX}$		9.5	10	10.5	V
BRITE_A Potentiometer Value at Full Bright	POT	BRITE_A to RETURN	8	10	12	k Ω
BRITE_A Voltage for Full Dim	$V_{BRITE_A_MIN}$		0.95	1	1.05	V
Minimum Output Current	I_{MIN}	BRITE_A = 0.95V	8	10	12	% of Max
Output Current Dim Range (Analog Dimming)		$I_{LED} = 700mA$, BRITE_A = 0.95V Versus BRITE_A $\geq 10V$		10		RATIO
Shutdown Voltage	V_{BRITE_SD}				0.6	V

Protection

Overvoltage Protection	V_{OV}	Maximum OUT(+)			52	V
Over Temperature Shutdown	T_{OT}	Over Case Temperature Protection Hot Spot	95			$^\circ C$

Safety & EMC Compliance

UL / CE	Compliance to UL8750 & UL1310 Class 2 File E337545
	EN 61347-1, EN61347-2-13 Pending
FCC Title 47, Part 15	Conducted and Radiated Emission, Class B
EN 55015	Conducted emission
EN 61000-3-2	Harmonic current emissions
EN 61000-3-3	Voltage fluctuations and flicker



Safety & EMC Compliance

EN 61547 Pending	Specification for equipment for general lighting purposes. EMC immunity requirements	
	Standard	Test Items
	EN61000-4-2	Electrostatic Discharge Immunity
	EN61000-4-3	Radiated Susceptibility test
	EN61000-4-4	Electrical Fast Transient
	EN61000-4-5	Surge Immunity Test, AC Power Line, Line to Line 2kV, Line to Earth 4 kV
	EN61000-4-6	Conducted Susceptibility Immunity test
	EN61000-4-8	Power Frequency Magnetic Field Immunity Test
	EN61000-4-11	Voltage Dips and Interruption Immunity
Life Expectancy	5 years / 50,000 hours @ 100% duty at maximum case temperature 55°C	
Environmental Standards	EU RoHS, REACH	

LEAD DESCRIPTION

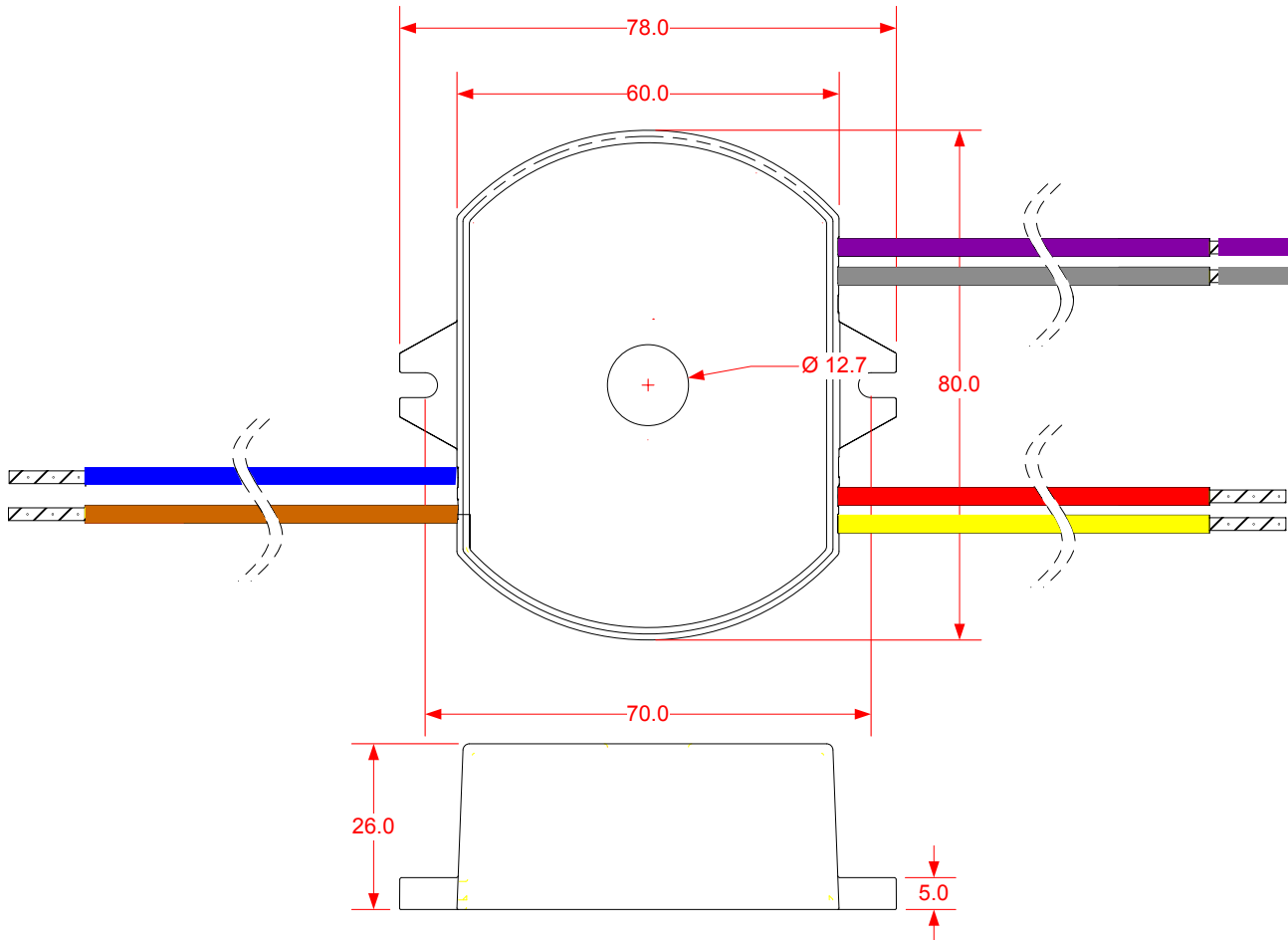
Name	Pin #	Description
INPUT TERMINAL LEADS (18AWG)		
BROWN	AC L	Main Input Power Supply Line 100V _{AC} to 277V _{AC}
BLUE	AC N	Main Input Power Supply Neutral
CONTROL TERMINAL LEADS (22AWG)		
PURPLE	BRITE_A	Analog Dimming Input (Full Brightness if Open)
GRAY	RETURN	Dimming Return
OUTPUT TERMINAL LEADS (18AWG)		
RED	OUT(+)	LED String Anode Voltage (High Side)
YELLOW	OUT(-)	OUT(-) LED Cathode Voltage (Low Side) 700mA

OPERATING STATES

CONDITION	LED ON	DRIVER STATUS	COMMENT
OUT(+) String OUT(-) (700mA)	YES	ON	
OUT(+) OPEN OUT(-)	NO	OUT(+) Max Voltage	
OUT(+) Short OUT(-)	NO	SHUTDOWN	
OUT(+) String OUT(-) w/ 1 or more LED short	YES	ON	STAYLIT™ , OUT(+) ≥ 14V
Over Temperature at the Case Hot Spot	NO	SHUTDOWN	When the temperature goes down, the module turns on again (no user intervention)
Power Loss (Blackout) Event	NO	SHUTDOWN	When Power comes back, the module turns on again (no user intervention)
BRITE_A SHORTED TO RETURN or OUT(-)	NO	SHUTDOWN	
BRITE_A OPEN (or Resistor > 12kOhm)	YES	ON	



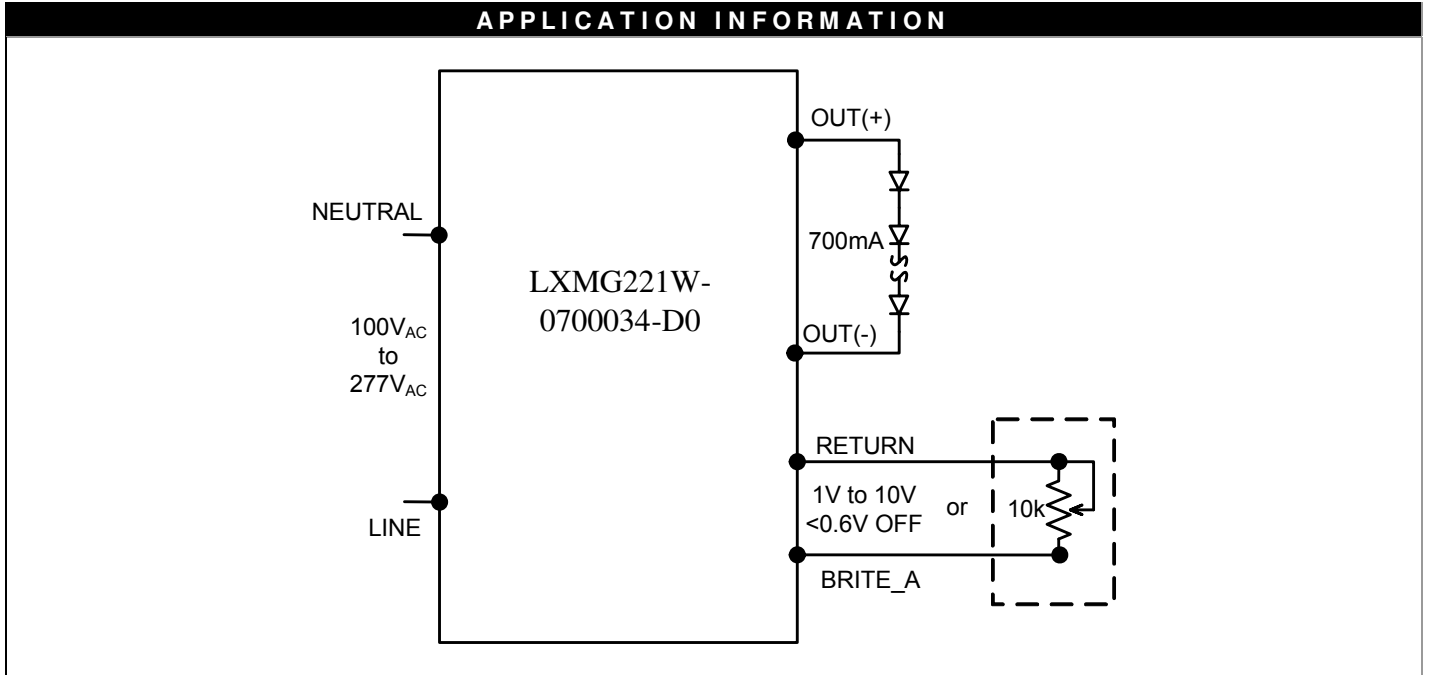
MECHANICAL DRAWING



Wire length is 160mm ± 5mm, stripped 12mm ± 2mm UL1015 AWG#18 16/30 stranded 105°C Input & Output wires; AWG#22 7/30 stranded Control wires, all wires tinned. Please insure the wire nuts are installed correctly to prevent intermittent operation. Connecting the AC input to Control or Output wires will result in damage to the module. Hole in center, mounting tab slot width 4mm.



APPLICATION INFORMATION





Microsemi[®]

LXMG221W-0700034-D0

34W 700mA Dimmable LED Driver Module

PRODUCTION DATASHEET

NOTES

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