

# SMD - Surface LED Downlight Series

## Dimming Guide and Step-down Transformer Application Note

**HALO**

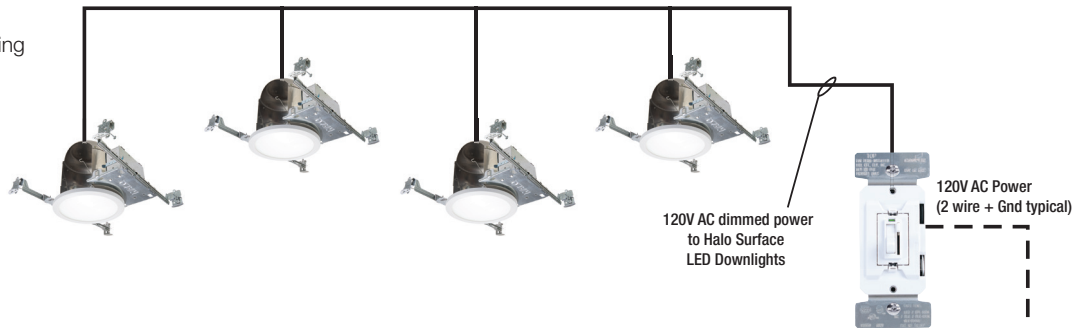
The SMD LED Series provides continuous dimming with reverse or forward phase cut dimmers; as low as 5% depending upon dimmer and low-end trim of the dimmer.

SMD4	SMD4-DM	SMD6	SMD6-DM
SMD4R6927WH	SMD4R6927WHDM	SMD6R6927WH	SMD4R6927WHDM
SMD4R6930WH	SMD4R6930WHDM	SMD6R6930WH	SMD4R6930WHDM
SMD4R6935WH	SMD4R6935WHDM	SMD6R6935WH	SMD4R6935WHDM
SMD4R6940WH	SMD4R6940WHDM	SMD6R6940WH	SMD4R6940WHDM
SMD4R6950WH	SMD4R6950WHDM	SMD6R6950WH	SMD4R6950WHDM
SMD4S6927WH	SMD4S6927WHDM	SMD6S6927WH	SMD4S6927WHDM
SMD4RS930WH	SMD4RS930WHDM	SMD6RS930WH	SMD4RS930WHDM
SMD4RS935WH	SMD4RS935WHDM	SMD6RS935WH	SMD4RS935WHDM
SMD4RS940WH	SMD4RS940WHDM	SMD6RS940WH	SMD4RS940WHDM
SMD4RS950WH	SMD4RS950WHDM	SMD6RS950WH	SMD4RS950WHDM

### Phase Control 120V Dimming

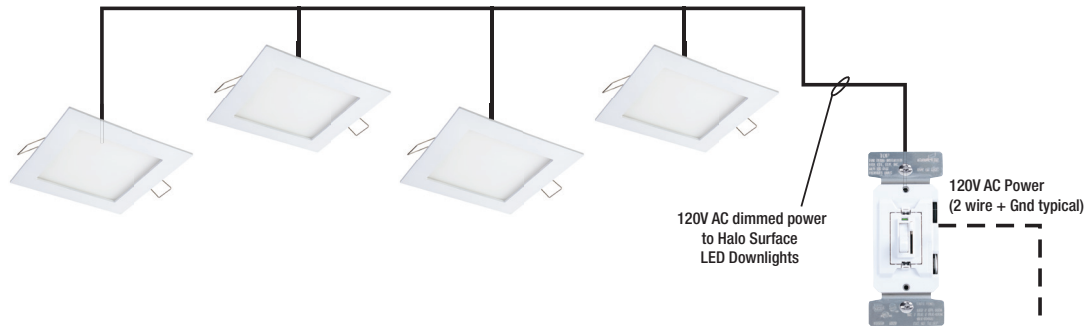
**Figure 1**

Recessed Housing Installation



**Figure 2**

Direct Mount Installation



Eaton's AL Series dimmers offer versatile options to set the mood and reduce energy consumption.

Visit [www.cooperwiringdevices.com/ALSeries](http://www.cooperwiringdevices.com/ALSeries) for more information.



Dimmer Features	Decorator dimmer DAL06P/WBSD-DEC	Slide dimmer SAL06P/WBSD-SLD	Toggle dimmer TAL06P/WBSD-TOG
Rapid Start feature*	Fully adjustable	Fixed ON	Fully adjustable
Adjustable high-end trim			
Adjustable low-end trim	•	•	•
Wiring configurations	Single-pole or 3-way	Single-pole or 3-way	Single-pole or 3-way
Color change kits	•		•

\*Note: The Rapid Start feature is used to ensure the right amount of power boost during start-up. When a dimmer with Rapid Start is turned on from a low dimmer setting, the LED lighting may exhibit a momentary flash. Select dimmer models offer an adjustment of the Rapid Start feature. The user may wish to adjust this setting to reduce the boost and resulting momentary flash. If this capability is desired, the user should select dimmer models designated as "fully adjustable" or "selectable ON or OFF".

## LED Rated Dimmers

Dimmer Make	Dimmer Series	Dimmer Model #	Types Of Dimmer	Minimum Luminaires (per circuit)	Maximum Recommended Luminaires (per circuit)	Min Dimming percentage (%)	Max Dimming percentage (%)	Low End Start-up time
EATON	Decorator	DAL06P	Triac (INC/HAL/MLV/ELV/CFL/LED)	1	23	3%	98%	<1s
EATON	Toggle	TAL06P	Triac(INC/HAL/MLV/ELV/CFL/LED)	1	23	4%	98%	<2s
EATON	Slide	SAL06P	Triac(INC/HAL/MLV/ELV/CFL/LED)	1	23	4%	98%	<1s
EATON	Slide	SLC03P	Triac (INC/HAL/CFL/LED)	1	23	4%	98%	<1s
EATON	Toggle	DLC03P	Triac (INC/HAL/CFL/LED)	1	23	4%	98%	<1s
EATON	iLumin	SC277-06-UN	Control Panel( Leading Edge)	1	38	3%	97%	<3s
Lutron	Diva	DVCL-153P		1	11	4%	97%	<1s
Lutron	Toggler	TGCL-153P		1	11	4%	97%	<1s
Lutron	Maestro	MACL-153-M		1	11	4%	97%	<1s
Lutron	Skylark	SCL-153P-VWH		1	11	4%	97%	<1s
Lutron	LC128	LP-RPM-4U-120		1	150	4%	98%	<1s
Lutron	LC128	LP-RPM-4A-120		1	94	1%	97%	<3s
Leviton	SureSlide	6674		1	11	6%	97%	<1s
Leviton	Illumatech	IPL06		1	11	4%	97%	<2s
Legrand	Pass&Seymour Harmony	H703PTUW		1	35	4%	99%	<1s

### Dimmer Rating - Load Type

**INC** = Incandescent

**HAL** = Halogen

**MLV** = Magnetic Low Voltage

**ELV** = Electric Low Voltage

**CFL** = Compact Fluorescent

## Incandescent and Electronic Low Voltage Rated Dimmers - For Reference Only

Testing conducted by Eaton's lighting division is not a substitute for and does not imply certification by an independent laboratory or any other standards certification. Refer to manufacturer specifications for more detailed information on product certifications and standards. Refer to this dimming guide notes section. Consult the dimmer manufacturer prior to installation to ensure compatibility.

Dimmer Make	Dimmer Series	Dimmer Model #	Types Of Dimmer	Minimum Luminaires (per circuit)	Maximum Recommended Luminaires (per circuit)	Min Dimming percentage (%)	Max Dimming percentage (%)	Low End Start-up time
EATON	Toggle	TI061	Triac (INC/HAL )	1	47	3%	95%	<1s
EATON	Aspire	9530AW	Triac(INC)	1	47	3%	100%	<3s
EATON	Rotary	RI061	Triac(INC/HAL)	1	47	15%	98%	<1s
EATON	Slide	SF8AP		1	76	20%	98%	<1s
EATON	Decorator	DE06P	ELV	1	47	3%	96%	<3s
Lutron	Toggler	TG-600P	Triac (INC )	1	47	1%	97%	<7s
Lutron	Diva	DV-600P	Triac (INC )	1	47	4%	97%	<1s
Lutron	Lumea	LG600P	Triac (INC/HAL )	1	47	6%	97%	<1s
Lutron	Skylark	S-600P	Triac (INC/HAL )	1	47	3%	97%	<1s
Lutron	Skylark Contour	CT103P	Triac (INC/HAL/MLV)	1	79	3%	97%	<1s
Lutron	Diva	DV603P	Triac (INC/HAL )	1	47	4%	97%	<1s
Lutron	Nova T	NTFTU-5A	Triac (Fluorescent )	1	47	16%	97%	<1s
Lutron	Maestro	MAELV600	ELV	1	47	4%	97%	<1s
Lutron	Faedra	FAELV500	ELV	1	39	4%	97%	<1s
Lutron	Diva	DVELV303P	ELV	1	23	1%	97%	<2s
Lutron	Skylark	SELV300P	ELV	1	23	1%	97%	<2s
Leviton	Decora	6673	Triac (CFL/INC)	1	47	30%	97%	<1s
Leviton	SureSlide	6631-2	Triac (INC )	1	47	4%	97%	<1s
Leviton		IPI06		1	47	4%	97%	<3s
Leviton	Vizia	VP106	Triac (INC )	1	47	4%	97%	<1s
Leviton	Decora	6161	Triac (INC )	1	39	4%	97%	<1s
Leviton	Sure Slide	6633-P		1	47	4%	97%	<1s
Leviton	Plug In Lamp Dimmer	TBI03	Triac	1	23	3%	99%	NA <sup>1</sup>
Leviton	Vizia	VPE06	ELV	1	47	4%	97%	<1s
Leviton	Illumatech	IPE04	ELV	1	23	6%	97%	<1s
Leviton	Vizia	VZE04	ELV	1	31	4%	97%	<1s
Lutron	Ariadni	AY-600P		1	47	1%	97%	<6s
Lutron	Contour	CT-103P		1	79	3%	97%	<1s
Lutron	Contour	CT-600P		1	47	3%	97%	<1s
Lutron	Rotary	D-600P		1	47	20%	97%	<1s
Lutron	Diva	DV-600P		1	47	3%	97%	<1s
Lutron	Glyder	GL-600P		1	47	3%	97%	<1s
Lutron	Lumia	LG-600PH		1	47	3%	97%	<1s
Lutron	Maestro	MA600		1	47	3%	97%	<1s
Lutron	Nova	N-600		1	47	4%	97%	<1s
Lutron	Skylark	S-600P		1	47	3%	97%	<1s
Lutron	Centurion	C-600P		1	47	0%	98%	NA <sup>1</sup>
Lutron	Ariadni	AYLV-600P		1	35	1%	3%	<7s
Lutron	Glyder	GLV-600		1	35	3%	97%	<1s
Lutron	Diva	DVLV-600P		1	35	0%	97%	NA <sup>1</sup>
Lutron	Lumina	LG-103P		1	79	3%	97%	<1s
Lutron	Skylark	SLV-600P		1	35	3%	97%	<1s
Lutron	Vierti	VT-600		1	47	4%	97	NA <sup>1</sup>
Lutron	Nova	NTLV-600		1	35	3%	97%	<2s
Lutron	Nova	NT-600		1	47	0%	97%	NA <sup>1</sup>

1. Will not illuminate at low end start up.

### Dimmer Rating - Load Type

**INC** = Incandescent                      **ELV** = Electric Low Voltage  
**HAL** = Halogen                              **CFL** = Compact Fluorescent  
**MLV** = Magnetic Low Voltage

### Dimmer Notes:

1. Start time is measured at the lowest dimmer setting.
2. Some LED rated dimmers have a "rapid start" design used to provide a momentary power boost for LED and CFL lamps during start-up. When a LED luminaire is on a dimmer with "rapid start" the boost may cause a momentary flash of the LED lighting. This "flash" is generated by the dimmer, and may be more noticeable when the dimmer is at a low setting. A solution is available in the following EATON dimmers which provide adjustment capability of the "rapid start": Decorator (DAL06P), Smart (AAL06), and Toggle (TAL06P). Refer to product specifications online at [www.cooperwiringdevices.com](http://www.cooperwiringdevices.com) for more details.

### Dimming Guide Disclaimer:

1. Leviton® is a registered trademark of Leviton Manufacturing Co. Inc.; Lutron® is a registered trademark of Lutron Electronics Co. Inc.; Lightolier® is a registered trademark of Philips Lighting; Hubbell® is a registered trademark of Hubbell Incorporated; Legrand® and Pass & Seymour® are registered trademarks of Legrand®. These companies and their tradenames, trademarks or brands, where noted, are associated with their respective company and are not associated with EATON.
2. Testing conducted by EATON is not a substitute for and does not imply certification by an independent laboratory or any other standards certification. Refer to the manufacturer specifications for more detailed information on product certifications and standards.
3. This is a representative list of typical dimmers as tested by EATON for performance with the designated LED luminaires only. Test data contained in this literature is based upon dimmers obtained in the marketplace.
  - Information about these other manufacturers products is obtained from packaging and published information made available by the manufacturer and is deemed to be reliable, but has not been verified.
  - Dimmer performance and perceived limitations of the dimmers are based on factors outside of EATON's control.
  - The specifications of these dimming controls and their conditions of use may change without notice to EATON or any other user.
  - EATON makes no specific recommendation on product selection and there are no warranties of performance or compatibility implied.
  - Installer must ensure proper local and national electrical codes are followed; and that the dimmer application and condition of use is per dimmer manufacturer instructions and guidelines.

## Application Note

H277, H347 and H347200 step-down transformers are qualified to drive multiple Halo LED on a single circuit in Non-IC construction. Installation of these transformers with individual LED fixtures on circuits with multiple LED loads is not recommended. This is not recommended due to resulting multiple inductive currents pulled by each transformer; in this situation the majority of the power would then be reactive (VARs) and not real (WATTS). If H277, H347 or H347200 transformers should be used individually on each LED fixture in a single circuit, then that circuit should be sized for lowered power factor as well as increased apparent power on the circuit. H277, H347 and H347200 are UL/cUL listed for use with Halo recessed housings: H750T, H750TCP, H7T, H7TNB, H7RT.

## Step Down Transformers

**H277** = Steps 277 line voltage down to 120 volts. Attaches to knockout on first fixture's junction box in a circuit and is 300VA rated. H277 is a UL recognized Component listed under the luminaire UL/cUL listing for Halo Non-IC housings.

**H347 and H347200** = Steps 347 line voltage down to 120 volts. Attaches to knockout on first fixture's junction box in a circuit. H347 is 75VA and H347200 is 200VA rated. H347 is a CSA/UL Listed Component for use under the luminaire UL/cUL listing with Halo Non-IC housings.

### Transformer Load - H277 (300VA)

1. H277 Transformer at full loading consumes a maximum of 16W of power.
2. When a dimmer or switch is on the secondary (120V) side of the transformer, power is consumed by the transformer when the dimmer or switch is in "OFF" mode at 6.5W and in "ON" mode at 16W maximum under full loading.
3. When a switch is on the primary (277V) side ahead of the transformer, power is consumed only in "ON" mode to a maximum of 16W under full loading. (Use of a dimmer ahead of the transformer is not recommended)

### Transformer Load - H347 (75VA)

1. H347 Transformer at full loading consumes a maximum of 15W of power.
2. When a dimmer or switch is on the secondary (120V) side of the transformer, power is consumed by the transformer when the dimmer or switch is in "OFF" mode at 2.5W and in "ON" mode at 15W maximum under full loading.
3. When a switch is on the primary (347V) side ahead of the transformer, power is consumed only in "ON" mode to a maximum of 15W under full loading. (Use of a dimmer ahead of the transformer is not recommended)

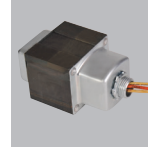
### Transformer Load - H347200 (200VA)

1. H347200 Transformer at full loading on 120V side consumes a maximum of 28W of power.
2. When a dimmer or switch is on the secondary (120V) side of the transformer, power is consumed by the transformer when the dimmer or switch is in "OFF" mode at 9.2W and in "ON" mode at 28W maximum under full loading.
3. When a switch is on the primary (347V) side ahead of the transformer, power is consumed only in "ON" mode to a maximum of 28W under full loading. When a switch is on the primary (277V) side ahead of the transformer, power is consumed only in "ON" mode to a maximum of 12W under full loading. (Use of a dimmer ahead of the transformer is not recommended)

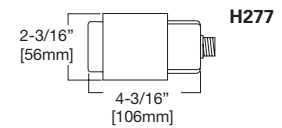
## SMD - Surface LED Downlight Series

SMD Maximum Units on Step Down Transformer  
Powered Circuits

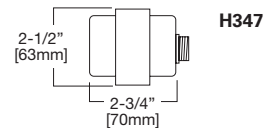
	VA Rating	SMD4, SMD6 - 80 CRI	
		SMD4 - 90 CRI Max # of Fixtures	SMD6 - 90 CRI Max # of Fixtures
<b>H277</b>	300	18	16
<b>H347</b>	75	4	4
<b>H347200</b>	200	12	10



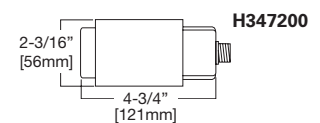
**H277**  
277V Step Down Transformer,  
300VA



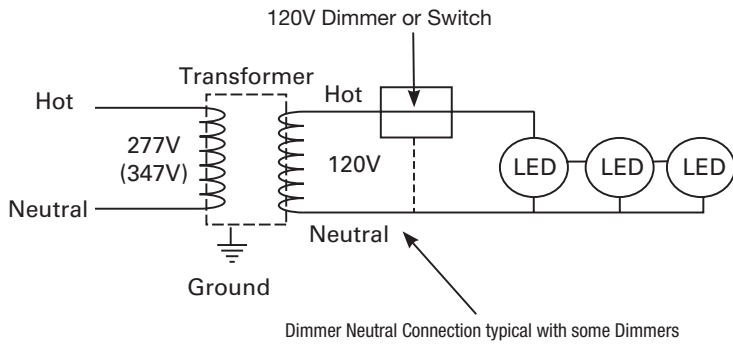
**H347**  
347V Step Down Transformer,  
75VA



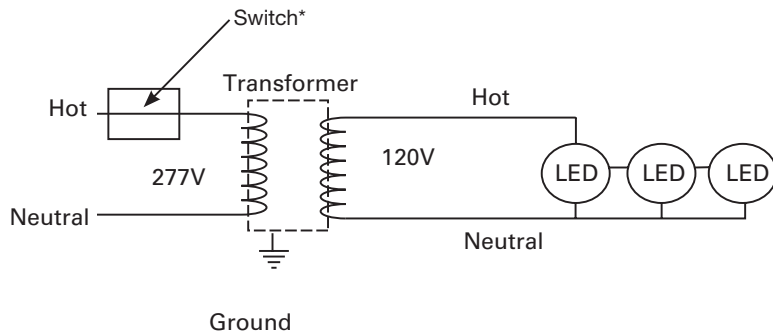
**H347200**  
347V Step Down Transformer,  
200VA



### Transformer with Dimmer/Switch on 120V Secondary

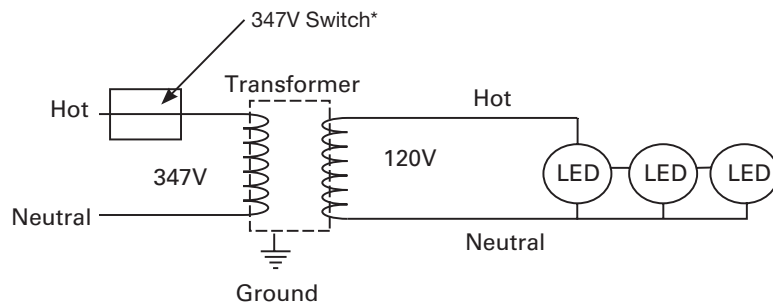


### Transformer with Switch on 277V Primary



\*Use of a dimmer ahead of the transformer is not recommended

### Transformer with Switch on 347V Primary



\*Use of a dimmer ahead of the transformer is not recommended