

# RSQ All-Purpose Square Lens LED Modules

## Dimming Guide and Step-down Transformer Application Note

**HALO**

The RSQ LED Series provides continuous dimming with reverse or forward phase cut dimmers.

### RSQ4

RSQ4089271EMWWB  
RSQ4089301EMWWB  
RSQ4089351EMWWB  
RSQ4089401EMWWB

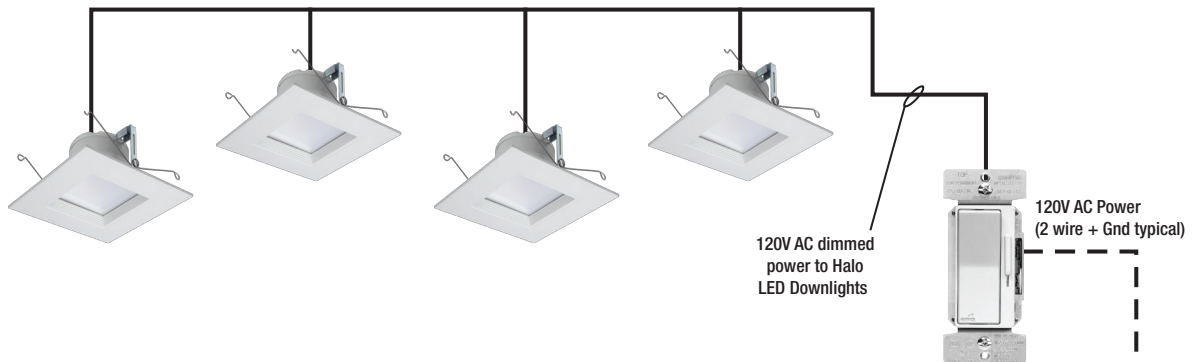
### RSQ5

RSQ5089271EMWWB  
RSQ5089301EMWWB  
RSQ5089351EMWWB  
RSQ5089401EMWWB

### RSQ6

RSQ6089271EMWWB  
RSQ6089301EMWWB  
RSQ6089351EMWWB  
RSQ6089401EMWWB

## Phase Control Dimming



Eaton dimmers offer versatile options to set the mood and reduce energy consumption. Visit [www.eaton.com](http://www.eaton.com) for more information.



Dimmer Features	DEVINE (DAL06P)	SKYE (SAL06P)	TRACE (TAL06P)
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	•		•

## HALO HOME™



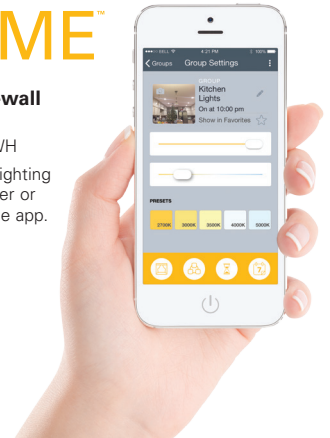
### HALO Home In-wall Smart Dimmer

HIWMA1BLE40AWH

Controls standard lighting fixtures with dimmer or HALO Home mobile app.

Features include:

- ON/OFF
- Dim
- Group
- Scene
- Schedule



\*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. Designated 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 noted as "fully adjustable" or "selectable ON or OFF".

## Compatible Dimmers

Dimmer Make	Dimmer Series	Dimmer Model #	Minimum Luminaires (per circuit)	Maximum Recommended Luminaires (per circuit)	Min Dimming percentage (%)	Max Dimming percentage (%)	Low End Start Time
Eaton	Smart	AAL06	1	24	4%	100%	<1s
Eaton	Devine	TAL06P	1	24	5%	100%	<1s
Eaton	Toggle	DAL06P	1	24	4%	100%	<1s
Eaton	Skye	SAL06P	1	24	5%	100%	<1s
Eaton	Skye	SLC03P	1	24	5%	100%	<1s
Eaton	Devine	DLC03P	1	24	5%	100%	<1s
Eaton	Halo Home	HIWMA1BLE40AWH	1	24	1%	99%	>1s
Lutron	Diva	C-L wall-mount dimmers (T8, T9)	1	15	10%	98%	<1s
Lutron	Skylark	C-L wall-mount dimmers (T8, T9)	1	15	10%	98%	<1s
Lutron	Skylark Contour	C-L wall-mount dimmers (T8, T9)	1	15	10%	98%	<1s
Lutron	Ariadni / Toggler	C-L wall-mount dimmers (T8, T9)	1	15	10%	98%	<1s
Lutron	Lumea	C-L wall-mount dimmers (T8, T9)	1	15	10%	98%	<1s
Lutron	RadioRA 2	RRD-10ND	1	15	8%	98%	<1s
Lutron	HomeWorks QS	HQRD-10ND	1	15	8%	98%	<1s
Lutron	RadioRA 2	RRD-6NA	1	15	10%	98%	<1s
Lutron	Maestro Wireless	MRF2-6ELV	1	15	10%	98%	<1s
Lutron	HomeWorks QS	HQRD-6NA	1	15	10%	98%	<1s
Lutron	HomeWorks	HxD-6ND	1	6	9%	97%	<1s
Lutron	Stanza	SZ-6ND	1	6	9%	97%	<1s
Lutron	Power Modules	PHPM-PA with Grafik Eye QS Main Unit	1	105	10%	99%	<1s
Lutron	Power Modules	PHPM-WBX with 3-wire fluorescent control	1	105	10%	99%	<1s
Lutron	Panel Module	HW/LP-RPM-4A-120	1	104	10%	99%	<1s
Lutron	Panel Module	HW/LP-RPM-4U-120	1	30	9%	99%	<1s
Lutron	Grafik QS/Wallbox Power Module	"Grafik Eye QS Main Unit Family/ LQRJ-WPM-6P"	1	30	10%	100%	<1s
Lutron	Panel Module	GP (Harrier) Card	1	30	9%	99%	<1s
Lutron	Grafik Eye 3000/HomeWorks	Grafik Eye 3000 Family/HWI-WPM-6D-120	1	30	10%	100%	<1s
Lutron	RadioRA 2	RRD-6CL (R3)	1	15	9%	97%	<1s
Lutron	Maestro Wireless	MRF2-6CL (M6)	1	15	9%	97%	<1s
Lutron	HomeWorks QS	HQRD-6CL (H2)	1	15	9%	97%	<1s
Lutron	HomeWorks QS	HQRA-6CL (H2)	1	15	9%	97%	<1s
Lutron	RadioRA 2	RRD-H6BRL (with neutral)	1	10	9%	97%	<1s
Lutron	HomeWorks QS	HQRD-H6BRL (with neutral)	1	10	9%	97%	<1s
Lutron	HomeWorks QS/myRoom	LQSE-4A1-D	1	10	9%	100%	<1s
Lutron	HomeWorks QS/myRoom	MQSE-4A1-D	1	10	9%	100%	<1s
Lutron	HomeWorks QS/myRoom	MQSE-3A1	1	10	9%	100%	<1s
Lutron	HomeWorks QS/myRoom	MQSE-2A1-D	1	10	9%	100%	<1s
Lutron	Grafik T	GT-5NEM	1	26	10%	99%	<1s
Lutron	Grafik T	GTJ-5NEM	1	26	10%	99%	<1s
Lutron	Nova T	NTRP-250	1	26	8%	99%	<1s
Lutron	Skylark Contour Slide to Off	CTCL-150	1	15	10%	98%	<1s
Lutron	Caseta Wireless Phase Selectable	PD-5NE	1	26	10%	98%	<1s
Lutron	Vive	MRF2S-6ELV	1	15	10%	98%	<1s
Lutron	Vive	MRF2S-6CL	1	15	9%	97%	<1s
Lutron	HomeWorks QS	LQSE-4A-120-D	1	19	10%	99%	<1s
Lutron	Maestro	MACL-LFQ	1	7	10%	98%	<1s
Lutron	Lumea Slide-to-Off	LECL-150H	1	15	10%	98%	<1s
Lutron	Caseta Wireless	PD-6WCL (SD12)	1	15	9%	97%	<1s

## For Reference Only

Dimmer Make	Dimmer Series	Dimmer Model #	Minimum Luminaires (per circuit)	Maximum Recommended Luminaires (per circuit)	Min Dimming percentage (%)	Max Dimming percentage (%)	Low End Start Time
Leviton	Decora	6673	1	48	16%	99%	<1s
Leviton	SureSlide	6674	1	12	5%	100%	<1s
Leviton	SureSlide	6631-2	1	48	0%	99%	N.A. <sup>1</sup>
Leviton	Illuminatech	IPL06	1	12	4%	99%	<1s
Leviton	Vizia	VP106	1	48	2%	99%	>1s
Leviton	Decora	6161	1	40	6%	99%	>1s
Leviton	SureSlide	6633-P	1	48	0%	100%	N.A. <sup>1</sup>
Lutron	Toggler	TG-600P	1	48	0%	98%	>1s <sup>2</sup>
Lutron	Nova T	NTFTU-6A	1	11	18%	100%	<1s
Lutron	Maestro	MAW600	1	48	4%	99%	<1s
Lutron	Toggler	TGCL-153P	1	12	4%	98%	<1s
Lutron	Lumea	LG600P	1	48	0%	99%	N.A. <sup>1</sup>
Lutron	Skylark	SCL-153P-WH	1	12	4%	99%	<1s
Lutron	Diva	DV603P	1	48	0%	99%	N.A. <sup>1</sup>
Lutron	Diva	DVCL-153P	1	12	4%	99%	<1s
Lutron	Maestro	MACL-153-M	1	12	5%	98%	<1s
Leviton	Vizia	VPE06	1	48	4%	100%	<1s
Leviton	Illuminatech	IPE04	1	24	3%	100%	<1s
Leviton	Vizia	VZE04	1	32	6%	100%	<1s
Leviton	Acenti	ATX10	1	81	3%	100%	<1s
Lutron	Maestro	MAELV600	1	48	6%	100%	<1s
Lutron	Faedra	FAELV500	1	40	6%	100%	<1s
Lutron	Diva	DVELV303P	1	24	3%	100%	<1s
Lutron	Skylark	SELV300P	1	24	3%	100%	<1s
EWD	Smart	AAL06	1	24	4%	100%	<1s
Lightolier	Sunrise	ZP260QEW	1	21	5%	100%	<1s
Eaton	Aspire	9530AW	1	48	0%	100%	N.A. <sup>1</sup>
Eaton	React	RI061	1	48	0%	100%	N.A. <sup>1</sup>
Eaton	Devine	TAL06P	1	24	5%	100%	<1s
Eaton	Toggle	DAL06P	1	24	4%	100%	<1s
Eaton	Skye	SAL06P	1	24	5%	100%	<1s
Eaton	Skye	SLC03P	1	24	5%	100%	<1s
Eaton	Devine	DLC03P	1	24	5%	100%	<1s
Eaton	Toggle	TI061	1	48	0%	97%	N.A. <sup>1</sup>
Lutron	LCP128	LP-RPM-4U-120	1	35	0%	100%	N.A. <sup>1</sup>
Lutron	LCP128	LP-RPM-4A-120	1	22	1%	100%	<1s
Lutron	Ariadni	AY-600P	1	48	1%	100%	>1s
Lutron	Contour	CT-103P	1	81	0%	100%	N.A. <sup>1</sup>
Lutron	Contour	CT-600P	1	48	0%	100%	N.A. <sup>1</sup>
Lutron	Rotary	D-600P	1	48	0%	100%	N.A. <sup>1</sup>
Lutron	Diva	DV-600P	1	48	0%	100%	N.A. <sup>1</sup>
Lutron	Glyder	GL-600P	1	48	0%	100%	N.A. <sup>1</sup>
Lutron	Lumina	LG-600PH	1	48	0%	100%	N.A. <sup>1</sup>
Lutron	Maestro	MA-600		48	5%	100%	>1s
Lutron	Nova	N-600	1	48	0%	100%	N.A. <sup>1</sup>
Lutron	Skylark	S-600P	1	48	0%	99%	N.A. <sup>1</sup>
Lutron	Centurion	C-600P	1	48	0%	100%	N.A. <sup>1</sup>
Lutron	Ariadni	AYLV-600P	1	36	0%	100%	N.A. <sup>2</sup>
Lutron	Glyder	GLV-600	1	36	0%	100%	N.A. <sup>1</sup>
Lutron	Diva	DVLV-600P	1	36	0%	99%	N.A.
Lutron	Lumina	LG-103P	1	81	0%	99%	N.A.
Lutron	Skylark	SLV-600P	1	36	0%	100%	N.A. <sup>1</sup>
Lutron	Nova	NTLV-600	1	36	1%	100%	<1s
Lutron	Nova	NT-600	1	48	0%	100%	N.A. <sup>1</sup>

1. Dim to off.

2. Shimmer at lower dim setting.

#### Dimmer Notes:

- 1) Start time is measured at the lowest dimmer setting.
- 2) Some LED dimmers have a "rapid start" design used to provide a momentary power boost to 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 with EATON dimmers which provide adjustment capability of the "rapid start": Devine (DAL06P), Accell (AAL06P), and Trace (TAL06P). Refer to product specifications online at [www.eaton.com/lighting](http://www.eaton.com/lighting) 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 lighting solutions business 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 lighting solutions or any other user. EATON lighting solutions 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 dimmer or 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)

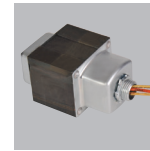
**Transformer Load - H347200 (200VA)**

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)

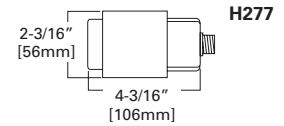
**HLB Retrofit LED Downlight Series**

(HLB Maximum Units on Step Down Transformer Powered Circuits)

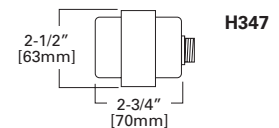
Transformer	VA Rating	Max # of Fixtures	
		600 Series	900 Series
H277	300	24	16
H347	75	6	4
H347200	200	16	10



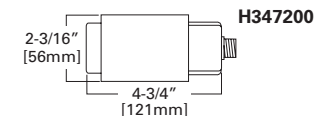
**H277**  
277V Step Down Transformer, 300VA



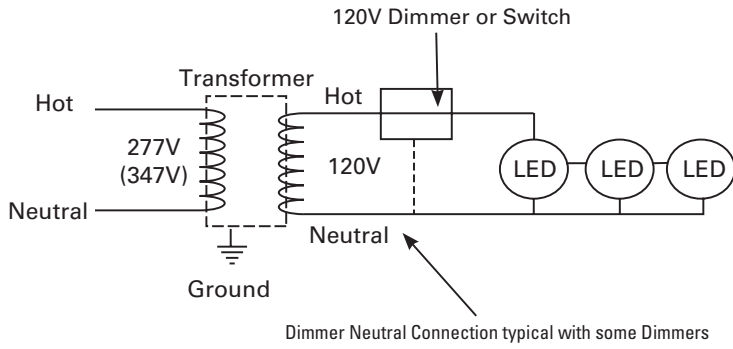
**H347**  
347V Step Down Transformer, 75VA



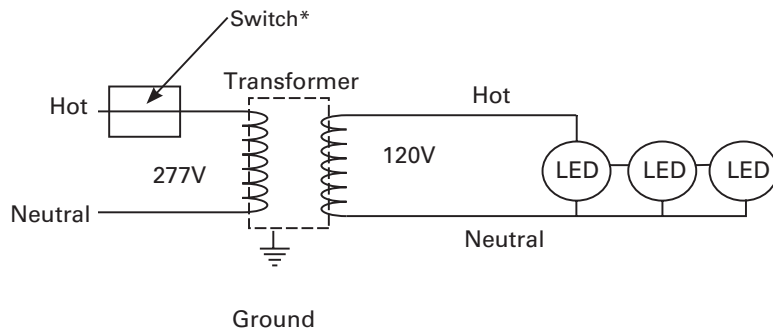
**H347200**  
347V Step Down Transformer, 200VA



## Transformer with Dimmer/Switch on 120V Secondary

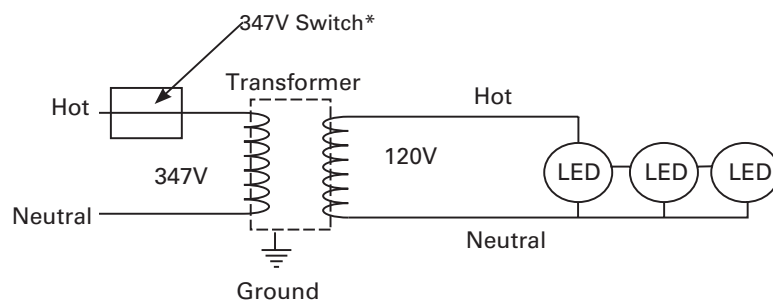


## Transformer with Switch on 277V Primary



\*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