

30 Watts

- +24VDC Input [22 to 30V]
- Output Voltage & Current Regulated
- 0 to 100% Programmable Voltage & Current
- Voltage & Current Monitor Outputs
- Operating Temperature: -40°C to +70°C
- Short Circuit, Arc, and Overload Protections
- On-board +5V Reference
- Efficiency >80%
- Low Ripple <0.05%
- 3 Year Warranty



Dimensions:

HRL30:
3.0 x 1.5 x 0.75" (76.2 x 38.1 x 19.05 mm)

Key Applications:

- Mass Spectrometry
- Electrophoresis
- E-beam/Ion Beam
- Electrostatic Chuck
- Capacitor Charging

Models & Ratings

Output voltage	Output current	Input current		Ripple & Noise	Model number
		No load	Full load		
0 to +100V	300mA				HRL3024S100P ⁽¹⁾
0 to -100V	300mA				HRL3024S100N ⁽¹⁾
0 to +200V	150mA				HRL3024S200P ⁽¹⁾
0 to -200V	150mA				HRL3024S200N ⁽¹⁾
0 to +350V	85.7mA				HRL3024S350P ⁽¹⁾
0 to -350V	85.7mA				HRL3024S350N ⁽¹⁾
0 to +600V	50.0mA	45mA	1.55A	0.01%	HRL3024S600P
0 to -600V	50.0mA	45mA	1.55A	0.01%	HRL3024S600N
0 to +1000V	30.0mA	45mA	1.55A	0.04%	HRL3024S1K0P
0 to -1000V	30.0mA	45mA	1.55A	0.04%	HRL3024S1K0N
0 to +1500V	20.0mA				HRL3024S1K5P ⁽¹⁾
0 to -1500V	20.0mA				HRL3024S1K5N ⁽¹⁾
0 to +2000V	15.0mA				HRL3024S2K0P ⁽¹⁾
0 to -2000V	15.0mA				HRL3024S2K0N ⁽¹⁾
0 to +2500V	12.0mA				HRL3024S2K5P ⁽¹⁾
0 to -2500V	12.0mA				HRL3024S2K5N ⁽¹⁾
0 to +3000V	10.0mA				HRL3024S3K0P ⁽¹⁾
0 to -3000V	10.0mA				HRL3024S3K0N ⁽¹⁾
0 to +4000V	7.5mA				HRL3024S4K0P ⁽¹⁾
0 to -4000V	7.5mA				HRL3024S4K0N ⁽¹⁾
0 to +5000V	6.0mA				HRL3024S5K0P ⁽¹⁾
0 to -5000V	6.0mA				HRL3024S5K0N ⁽¹⁾
0 to +6000V	5.0mA				HRL3024S6K0P ⁽¹⁾
0 to -6000V	5.0mA				HRL3024S6K0N ⁽¹⁾

Notes

1. To be released.
2. Specifications after 30-minute warm up, at full load, maximum output voltage and 25°C, unless otherwise indicated.
3. No current and temperature derating.
4. Proper thermal management techniques are required to maintain safe case temperature at maximum power output.

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage Range	22	24	30	VDC	24 V nominal
Input Current			1.55	A	See Models and Ratings Table
Input Filter	Internal Pi filter				
Input Undervoltage Lockout	OFF/Shutdown @ <20.5V, ON/Restart @ >21.5V				
Input Overvoltage Protection	OFF/Shutdown @ >31.5V, ON/Restart @ <30.5V				
Input Reflected Ripple Current			TBD	mA pk-pk	
Programming Inputs	0		5	VDC	Analog DC Voltage Controls Output 0 to 100%, See Signals.
Overprogramming Protection		5.5		VDC	110% Max Voltage & Current

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage			6000	VDC	See Models and Ratings Table
Output Current			300	mA	See Models and Ratings Table
Output Programming	0		100	%	Output Voltage/Current programmable via Analog DC Programmig Voltage Input
Output Calibration Range		±5		%	Potentiometer, See Signals & Controls
Initial Setpoint Accuracy		±1		%	@ Max Vpgm, No Load
Linearity: Output vs Program			1	%	10 to 100% Output
Minimum Load	No minimum load required				
Start Up Response	See Applications Notes, page 5				
Line Regulation			0.01	%	CC / CV modes, 100% Vpgm, Full Load, [Min to Max Input]
Load Regulation			0.01	%	CC / CV modes, 100% Vpgm, 24Vin, [NL to FL]
Transient Response	TBD				
Ripple and Noise			0.05	%	1MHz bandwidth, See Models and Ratings Table
Temperature Coefficient		100		ppm/°C	
Stability			100	ppm/8hrs	
Short Circuit, Overload					Rectangular V/I characteristics.
Overtemp Protection		95		°C	Shutdown @ 95°C typical, +/-5%.

General

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency	80	85		%	Max Vpgm, Full Load
Isolation: Input to Output	N/A – Input ground is connected to output ground				
Isolated Baseplate			1500	VDC	At 24 VDC
Construction	DAP case. Solid vacuum encapsulation, UL 94 V-0 rated.				UL 94 V-0 rated
Switching Frequency		100		kHz	
Mean Time Between Failure	TBD			MHrs	MIL-HDBK-217F, +25 °C GB
Weight		0.26 (120 g)		lb (g)	

Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating (Case) Temperature	-40		+70	°C	Consult factory for extended operating temperature
Storage Temperature	-55		+125	°C	
Humidity			95	%RH	Non-condensing
Cooling					Natural convection

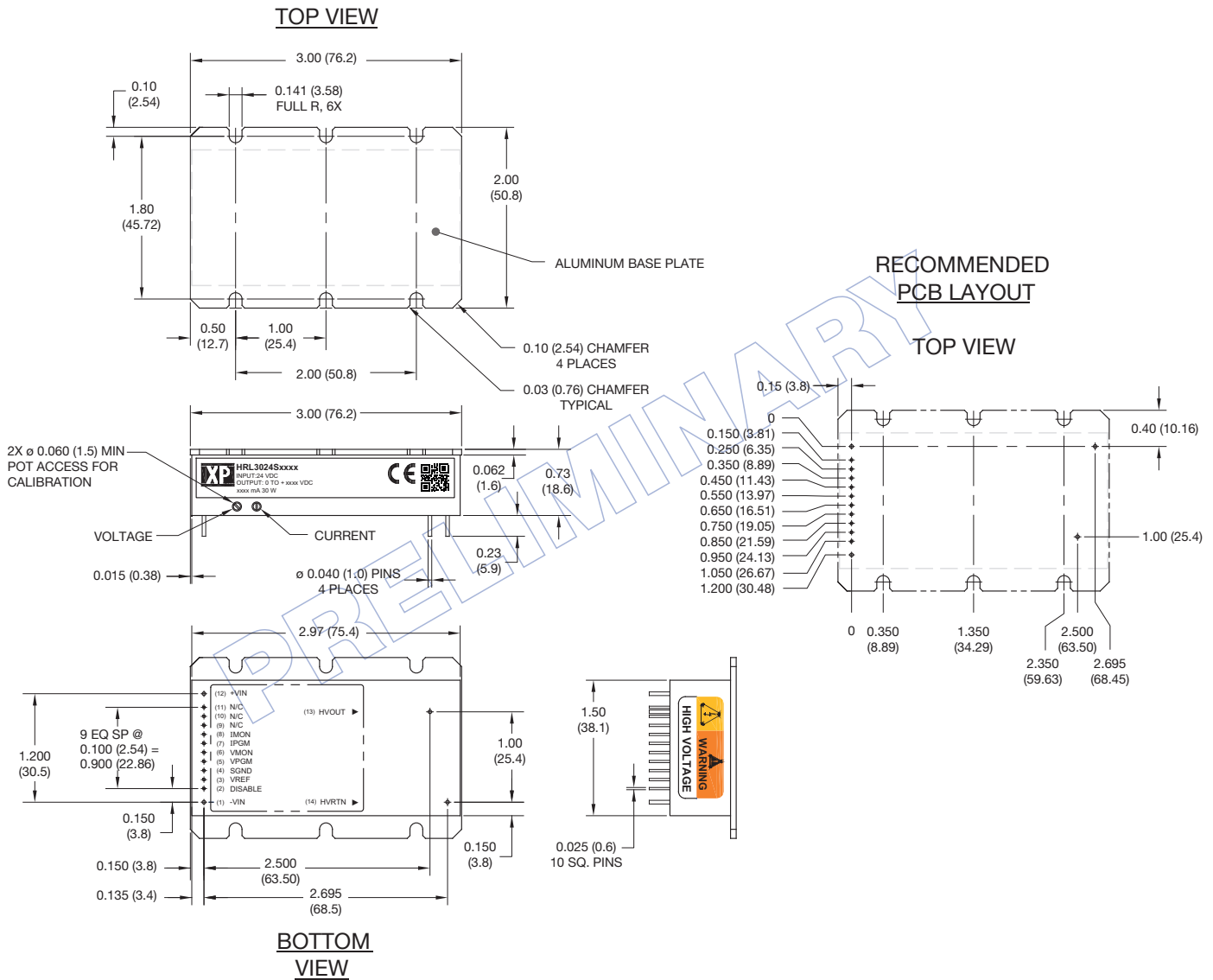
Safety Approvals

Safety Agency	Safety Standard	Notes & Conditions
UL	EN 60950	*UL pending
CE	CE Directive	
RoHS	RoHS 2 Directive (2011/65/EC)	

Signals

Characteristic	Pin	Function	Description
-VIN	1	Input Ground	Power Ground
DISABLE	2	Input: Remote Disable	Open or No Connect turns unit ON. Ground connection turns unit OFF
VREF	3	Output: Voltage Reference	+5V +/-2%
SGND	4	Signal Ground	Signal Ground
VPGM	5	Input: Voltage Programming	0V to +5V signal programs Vout from 0 to 100%, Z=100kohm.
VMON	6	Output: Voltage Monitor	0V to +5V output measures 0 to 100% Vout, 1% accuracy.
IPGM	7	Input: Current Programming	0V to +5V signal programs Iout from 0 to 100%, Z=100kohm.
IMON	8	Output: Current Monitor	0V to +5V output measures 0 to 100% Iout, 1% accuracy
N/C	9	N/A	
N/C	10	N/A	
N/C	11	N/A	
+VIN	12	Input: 24V _{in}	Power Input
HVOUT	13	Output: HV Output	High Voltage Output
HVRTN	14	HV Dedicated Return	High Voltage Return

Mechanical Details

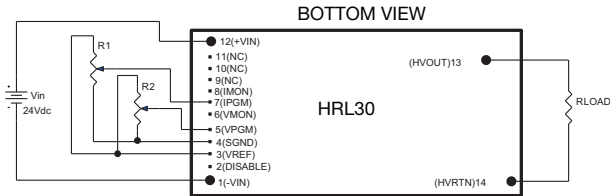


Notes

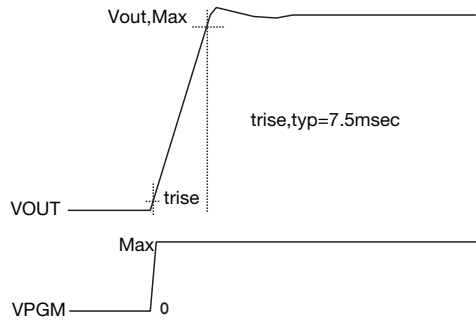
1. All dimensions are in inches (mm)
2. Weight: 0.26 lbs (120 g) approx
3. Tolerance: X.XX \pm 0.01 (X.X \pm 0.25)
4. Pin Tolerance: \pm 0.002 (\pm 0.05)

Application Notes

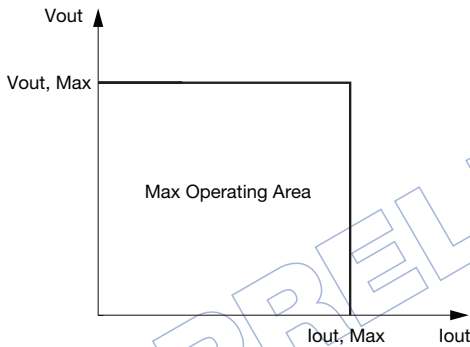
Vref programming



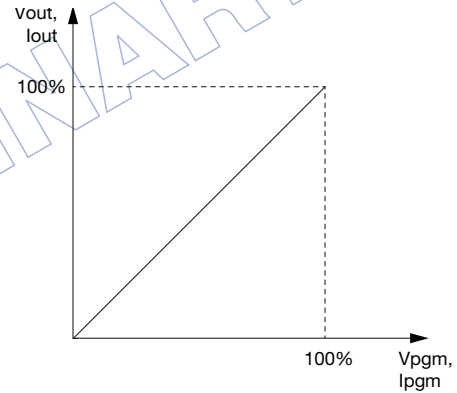
Response time Vout vs Vpgm



V/I rectangular characteristics



V/I programming linearity



Pout vs Vpgm

