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LV Series

60 Hz to DC

- High Density Linear Power Supply, up to 1.2W/in³
- Exceptionally Low Ripple and EMI
- Superior Regulation and Input Transient Protection

Specifications

Input:

105 to 125 V rms, 55 to 65 Hz, or 380 to 420 Hz single phase. Units may be operated down to 47 Hz with 20% derating.

Efficiency:

30% typical for 5 V; 50% for 28 V.

Line Regulation:

Within 0.05% for input change 105 to 125 V ac with load constant.

Load Regulation:

0.1% from no load to full load with line constant.

Tracking Accuracy:

LLV models. The negative output will track the positive output to within 75 mV for all rated conditions, when the positive output is set to nominal $\pm .1$ V dc.

Pard (Noise and Ripple):

1 mV rms or 5 mV peak-to-peak at 25 MHz bandwidth.

Isolation Voltage:

500 V dc input to output, input to case and output to case.

**Insulation Resistance:**

50 megohms minimum between input and output, input and case, output and case when measured at 50 V dc.

Polarity:

Inputs and outputs are isolated. Either positive or negative side of output may be grounded.

Temperature Range:

Operating -20°C to +71°C baseplate temperature; -40°C to +85°C (See Option T); storage temperature -55°C to +85°C.

Temperature Coefficient:

0.015% per degree celsius maximum.

Input Transient Protection:

In accordance with MIL-STD-1399, Section 103 (143.8 V ac for 0.3 second).

Load Transient Response:

Output voltage returns to regulation limits within 100 microseconds after a 50% step change in load current.

Load Transient Overshoot:

2% maximum from nominal voltage set point.

Short Circuit Protection:

Completely protected against short circuit of any duration. Output automatically restores to normal after removal of short.

Overvoltage Protection:

See Option -1.

Remote Error Sensing:

Regulator monitors the output voltage directly at the load using extra "sensing" leads and compensates for a dc voltage drop up to 0.4 volt in the load leads. (Single output models only.)

Electromagnetic Interference:

Units were designed and built to minimize EMI/EMC emissions, and comply with the requirements of MIL-STD-461A by virtue of their topology, construction and enclosure.

Reliability:

The MTBF calculated per MIL-HDBK-217D for LV5DE20-1, under operating conditions for 50°C baseplate temperature, maximum operating input voltage and full rated output power is 68,987 hours for ground benign and 10,384 hours for naval sheltered environments. With Enhanced Reliability Option -ER, ground benign is 236,033 hours; naval sheltered is 35,585 hours for Model LV5DE20-1-ER. (For dual output model, see Reliability section.) Consult factory for other model and environment information.

Environment:

Units are encapsulated and hermetically sealed to meet the environmental requirements of MIL-STD-810C and MIL-E-5400P. Units meet MIL-S-901C 5-foot hammer drop.

Severe Shock, Acceleration and Vibration:

Special encapsulation is standard and enables all units to withstand 60 g's shock, 50 g's acceleration and 30 g's vibration.





Options

The following standard options are available on the LV, LLV Series power supplies. Please refer to the option section of this catalog for detailed information.

Special Connectors:

A military-type hermetically sealed connector is provided as **Option A** in place of our standard header to extend out the top surface. (To order, replace "D" in model number with "A," i.e., LV5AE2.4.)

Wide Input Voltage:

Option H changes input specifications to: 210 to 250 V ac, 55 to 65 Hz, single phase; units may be operated 47 to 54 Hz with the "H" option. (To order, add "H" after "E" in the model number, i.e., LV5DEH2.4.)

Remote Turn On/Off:

Option L provides isolated terminals to turn output on/off with TTL logic signal. (To order, add "L" after "E" in model number, i.e., LV5DEL6.)

Over Temperature Protection:

Option -OT turns off input power when conduction surfaces exceed safe limits. (To order, add "-OT" to the end of the model number, i.e., LV5DE2.4-OT.)

Wider Operating Temperature:

-40°C to +85°C is available with **Option T**. Case size may increase. (To order, add "T" after "E" in model number, i.e., LV5DET2.4.)

Internal Overvoltage Protection:

Option -1 provides a crowbar internal OVP. Input must be recycled to restore output. (To order, add "-1" after model number, i.e., LV5DE2.4-1.)

Output Voltage Adjustment:

Option -2 provides externally accessible (screwdriver adjustment) potentiometer to adjust output voltages over specified range. (To order, add "-2" to the end of the model number, i.e., LV5DE2.4-2.)

Enhanced Reliability:

-ER Option provides increased reliability by using higher levels of military-grade components. Requires case size increase and power derating. (To order, add "-ER" to the end of the model number, i.e., LV5DE2.4-ER.)

18 Standard Single-Output Models

Output ¹ Voltage Range	Output Current (Amps)					Model Number
	2.4	6.0	10.0	20.0	Size (See Dwg.)	
4.75-5.25	2.4	6.0	10.0	20.0	9A	LV5DE2.4
		11C	12A	13B	3.8	LV5DE6
		6.9	9.3	13.9	3.1	LV5DE10
		4.2	6.4		4.2	LV5DE20
11.4-12.6	1.7	4.0	7.5		9A	LV12DE1.7
		11C	12A		3.8	LV12DE4
		6.9	9.3		3.1	LV12DE7.5
		4.2			4.2	
14.2-15.7	1.5	3.0	4.0	7.5	9A	LV15DE1.5
		11C	12A	13B	3.8	LV15DE3
		6.9	9.3	13.9	3.1	LV15DE4
		4.2	6.4		4.2	LV15DE7.5
±11-±13	0.5	0.9	1.5		11N	LLV12DE0.5
		12K	13D		4.2	LLV12DE0.9
		5.6	7.7		2.6	LLV12DE1.5
		3.5			3.5	
22.8-25.2	0.9	2.5	3.9	7.5	9A	LV24DE0.9
		11C	12A	13B	3.8	LV24DE2.5
		6.9	9.3	13.9	3.1	LV24DE3.9
		4.2	6.4		4.2	LV24DE7.5
26.6-29.4	0.75	2.0	3.15	7.5	9A	LV28DE0.75
		11C	12A	13B	3.8	LV28DE2
		6.9	9.3	13.9	3.1	LV28DE3.15
		4.2	6.4		4.2	LV28DE7.5
±14-±16	0.5	0.9	1.5		11N	LLV15DE0.5
		12K	13D		4.2	LLV15DE0.9
		5.6	7.7		2.6	LLV15DE1.5
		3.5			3.5	

1. Unit is equipped with an external trim pin which enables the output to be adjusted from a remote location.

Output voltage is continuously adjustable between the limits shown. An externally accessible screwdriver adjustment potentiometer may be substituted.

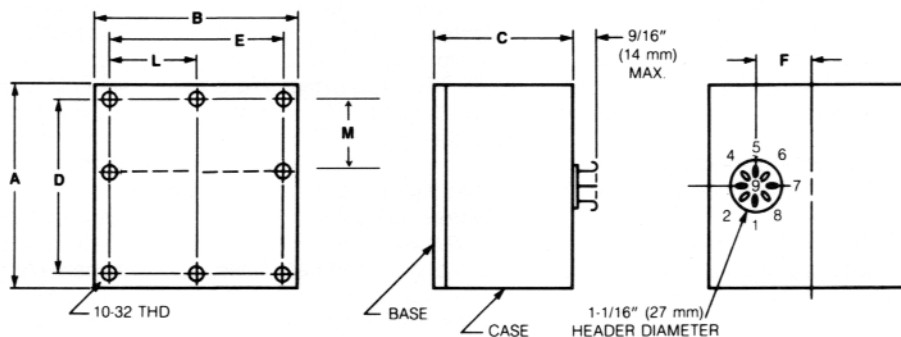
2. Maximum weight, not including options.
3. Current for each output.

Model Numbering System

Product Line Series	Nominal Output Voltage	Header Type	Encapsulation (Standard)	Options	Output Current Maximum Load
LV	5	D	E		20



Case Drawings



Dimensions

Inches
mm

Case Size	A	B	C	D	E	F	L	M
9A	2-3/4 70	4-3/4 121	3-3/4 95	2.25 57.2	4.25 108.0	7/8 22		
11C	4-1/4 108	5-1/4 133	4 102	3.75 95.3	4.75 120.7	1-7/8 48	2.38 60.5	
12A	4-1/2 114	6 152	4 102	4.00 101.6	5.50 139.7	2-1/4 57	2.75 69.9	
13B	5-1/2 140	6-1/2 165	5 127	5.00 127.0	6.00 152.4	2 51	3.00 76.2	
11N	3 76	6 152	3-3/8 86	2.50 63.5	5.50 139.7	2 51		
12K	4 102	6-1/4 159	3-3/8 86	3.50 88.9	5.75 146.1	7/8 22	2.88 73.2	
13D	5-1/2 140	6 152	3-3/8 86	5.00 127.0	5.50 139.7	1-1/2 38	2.75 69.9	2.75 69.9

Tolerances: If English unit is a fraction, $\pm 1/32$ inch, (0.8 mm); if English unit is a decimal, $\pm .015$ inch, (0.4 mm).

Material: Base — Aluminium 6061-T6, Case — Steel

Finish: Black flat lacquer per FED-STD-595, Color 37038.

Mounting: 10-32 THD inserts 5/32" minimum depth are provided in baseplate. Steel 10-32 bolts American

Standard, unified national fine series, slotted studs are supplied with each unit. Metric hardware and inserts available as a special order.



Pin Designations

(Standard model, not including options. Consult factory for details.)

Standard Header	Standard Models		Models with Internal OVP		Models with TTL (Option L)	
	LV	LLV	LV	LLV	LV	LLV
1	AC Input	AC Input	AC Input	AC Input	AC Input	AC Input
2	AC Input	AC Input	AC Input	AC Input	AC Input	AC Input
3	Ground	Ground	Ground	Ground	+5 Logic	+5 Logic
4	Not Used	Not Used	OVP Trim	+OVP Trim	5 V Return	5 V Return
5	+Output	+Output	+Output	+Output	+Output	+Output
6	+Sense	Common Output	+Sense	Common Output	+Sense	Common Output
7	-Output	-Output	-Output	-Output	-Output	-Output
8	-Sense	Not Used	-Sense	-OVP Trim	-Sense	Not Used
9	Output Trim	Output Trim	Output Trim	Output Trim	Output Trim	Output Trim

Input Current

(Typical)
Amps

