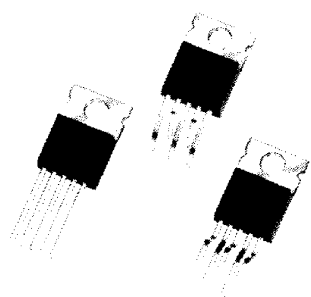


## LSH 6355P

### 5 AMP DC-TO-DC MICROCONVERTER



#### FEATURES

- Complete DC-to-DC converter
- 70% minimum efficiency
- 70kHz switching frequency
- Programmable output voltage from 5 to 27 Volts
- Preset output voltage of 5.05 Volts  $\pm 1.5\%$
- Current limit and thermal shutdown

#### DESCRIPTION

The LSH 6355P switching regulator is a micro-hybrid circuit designed for use in step-down applications requiring accurate output voltages over combined variations of line, load and temperature. This unique product greatly simplifies switching power supply design. The LSH 6355P micro-converter includes a switching regulator, catch diode and compensation network within a TO-220 style package. Just add a choke and two capacitors to obtain an efficient DC-to-DC converter for 5 Volts at 5 Amps. To increase the output voltage, simply add a programming resistor. The current limit and thermal shutdown features of the LSH 6355P fully protect the device against overstress conditions.

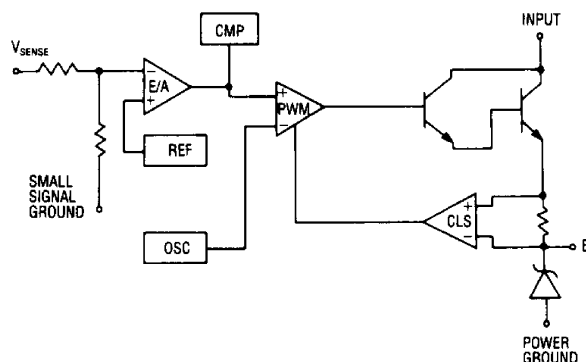
#### ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MAXIMUM	UNITS
Input Voltage	$V_{IN}$	35	Volts
Power Dissipation	$P_D$	Internally Limited	Watts
Thermal Resistance Junction to Case	$\theta_{JC}$	4.5	$^{\circ}\text{C/W}$
Operating Junction and Storage Temperature Range	$T_J$ $T_{STG}$	- 25 to 125	$^{\circ}\text{C}$
Lead Temperature (Soldering, 10 Seconds)	$T_{LEAD}$	260	$^{\circ}\text{C}$

#### DEVICE SELECTION GUIDE

DEVICE	LEAD CONFIGURATION
LSH 6355P	straight in-line
LSH 6355PV	vertical staggered
LSH 6355PH	horizontal staggered

#### BLOCK DIAGRAM



The LSH 6355P TO-220 style plastic package is available in three options to accommodate various mounting requirements. Available lead formations are straight in-line, staggered for vertical mount and staggered for horizontal mount.

## ELECTRICAL CHARACTERISTICS

Input test conditions are as follows:  $V_{IN} = 24\text{VDC}$ ,  $V_O = 5\text{VDC}$ ,  
 $I_O = 5\text{A}$ ,  $T_J = 25^\circ\text{C}$ , unless otherwise specified.

Parameter	Symbol	Test Conditions			Test Limits			Units
		$V_{IN}$	$I_O$	$T_J$	Minimum	Typical	Maximum	
Output Voltage <sup>1</sup>	$V_O$	12V to 35V	0A 0.5A to 5A	-25 to 125°C	4.97 4.80	5.05	5.13 5.30	Volts
Line Regulation <sup>1</sup>	$\text{REG}_{(\text{LINE})}$	12V to 35V				90		mV
Load Regulation <sup>1</sup>	$\text{REG}_{(\text{LOAD})}$		0.5A to 5A			45		mV
System Efficiency	$\eta$			-25 to 125°C	70	75		%
Switching Frequency	$f_{\text{SX}}$		50mA		58	70	86	kHz
Quiescent Current	$I_Q$	35V	0A			18	30	mA
Peak Current Limit Threshold	$I_{\text{CL}}$			-25 to 125°C	5.5		9	Amps
Output Noise and Ripple	$V_N$	$30\text{V} + 5V_{\text{pk-pk}}^4$				50		$\text{mV}_{\text{pk-pk}}$
Turn On Overshoot			0.5A to 5A			0		mV
Unit Step Load Change			0A to 5A 5A to 0.05A			0 250 <sup>2</sup>		$\text{mV}$ $\text{mV}_{\text{pk}}$
Programming Resistance <sup>3</sup>		12V to 35V		-25 to 125°C		0.2		Volts/k $\Omega$

(1) Low duty cycle, pulse testing with Kelvin connections required.

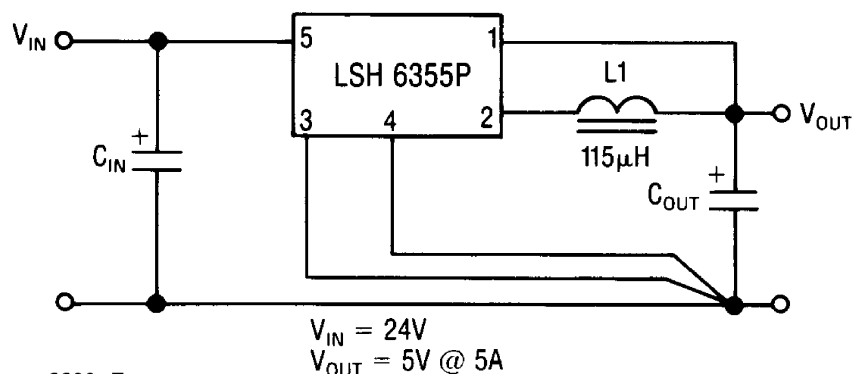
(2) 10mS duration.

(3)  $V_O$  programming above 5.05V to 27V.

(4) 120 Hz input ripple.

## TYPICAL APPLICATION

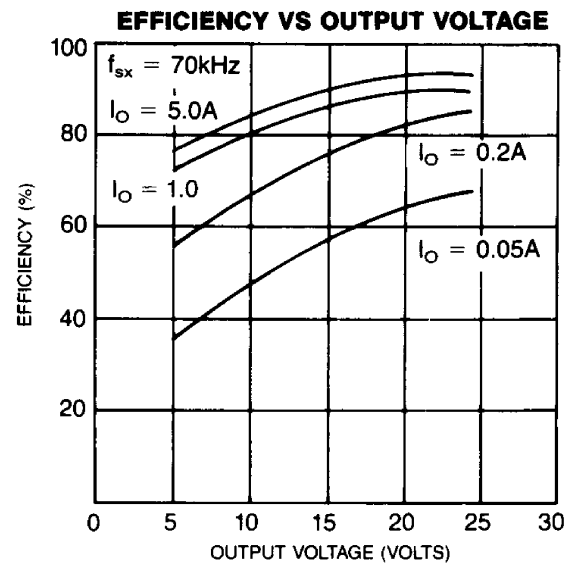
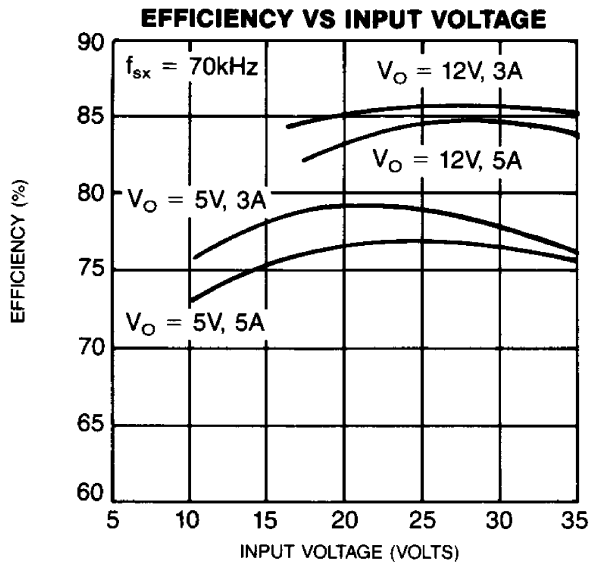
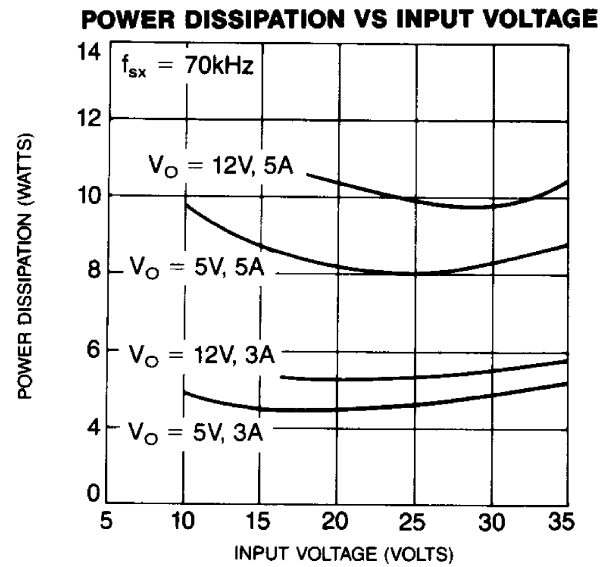
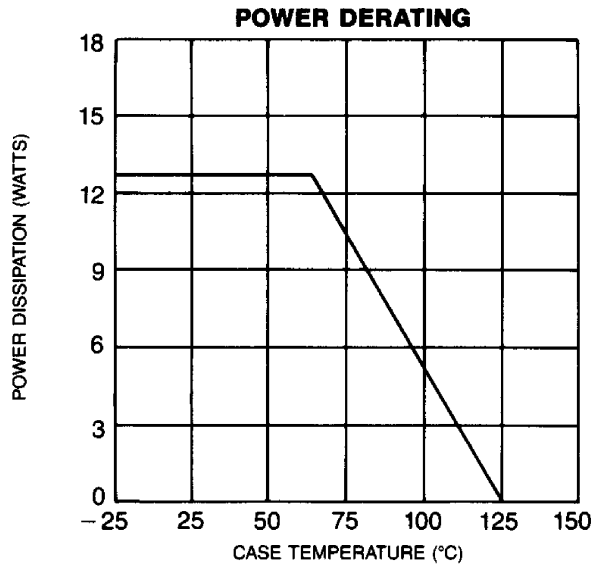
### DC-TO-DC STEP-DOWN CONVERTER<sup>1,2</sup>



<sup>1</sup>  $C_{IN} = 470\mu\text{F}$ ;  $C_{OUT} = 2200\mu\text{F}$

<sup>2</sup> For output voltages above 5V, add programming resistor between Pin 1 and  $V_{OUT}$ .

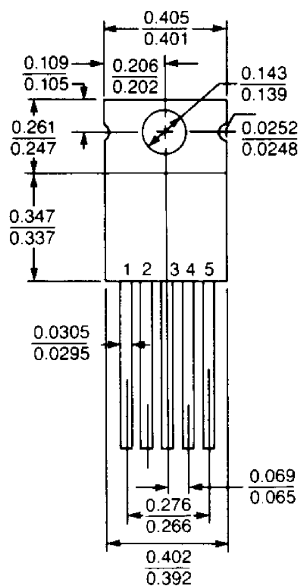
## OPERATIONAL DATA



## DEVICE OUTLINE

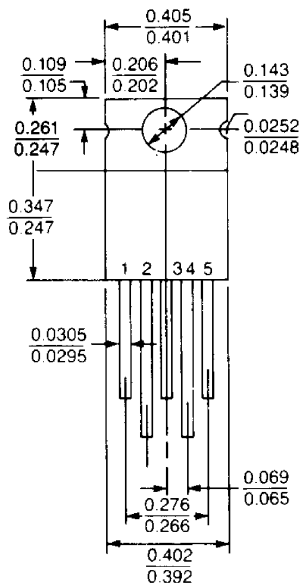
**LSH 6355P**

**(Front View)**



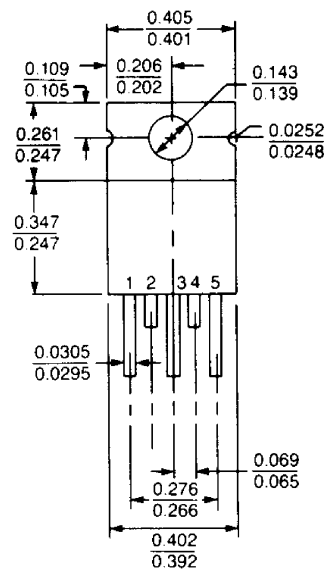
**LSH 6355PV**

**(Front View)**

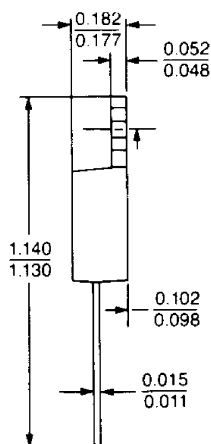


**LSH 6355PH**

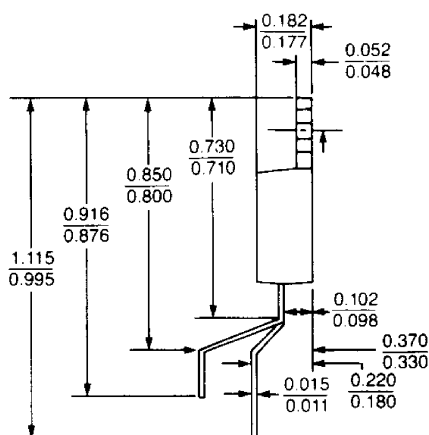
**(Front View)**



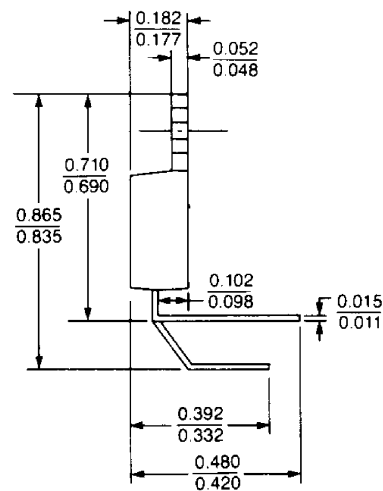
**(Side View)**



**(Side View)**



**(Side View)**



- |     |                        |
|-----|------------------------|
| 1   | — $V_{SENSE}$          |
| 2   | — $E_O$                |
| 3   | — Small Signal Ground  |
| 4   | — Power Ground         |
| 5   | — Input                |
| Tab | is Small Signal Ground |