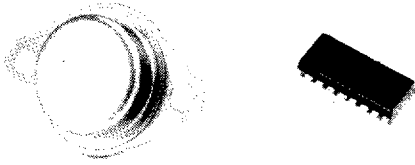


5 AMP SWITCHING REGULATORS

LAS-6350

LAS-6450



FEATURES

- Mil-Temperature Performance
- DC to 100 kHz operation
- Adjustable output voltage
- Cycle-by-cycle current limit
- Internal thermal shutdown
- Inhibit/enable control pin

DESCRIPTION

The LAS-6350/LAS-6450 Series are monolithic integrated circuits designed for fixed frequency, pulse width modulated, switching converter applications such as step-down, step-up, flyback, forward, Cuk and voltage inverting DC-to-DC converters and motor controls. The LAS-6350/LAS-6450 Series include a temperature compensated voltage reference, sawtooth oscillator with over-current frequency shift, linear trailing edge pulse width modulator with double pulse suppression logic, transconductance error amplifier, and a 5 amp Darlington output transistor with internal current limit protection.

The LAS-6350/LAS-6450 can be used in step-down or step-up applications. The LAS-6351/LAS-6451 are for step-down applications where current limit adjustment is necessary. The LAS-6350/LAS-6450 Series is available in TO-3 steel packages for true hermetic seal and board insertable plastic SIP packages.

Full military temperature range is also available for LAS-6450/51 TO-3 models.

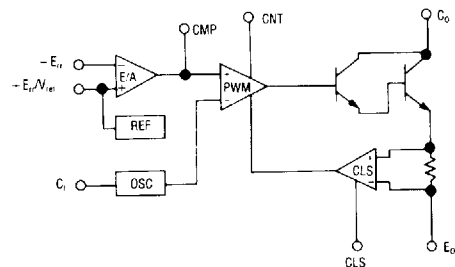
ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MAXIMUM	UNITS
Control Circuit/ Output Collector Voltage	V_{CC}/C_O		Volts
LAS-6350/51	C_O	35	
LAS6450/51		40	
Power Dissipation	P_D	Internally Limited	Watts
Thermal Resistance Junction to Case	θ_{JC}		$^{\circ}C/W$
TO-3		2.1	
SIP		1.1	
Operating Junction Temperature Range	T_J		$^{\circ}C$
TO-3 LAS-6450/51		-55 to 150	
SIP		-25 to 125	
TO-3 LAS-6350/51		-25 to 125	
Storage Temperature Range	T_{STG}	-65 to 150	$^{\circ}C$
Lead Temperature (Soldering)	T_{LEAD}		$^{\circ}C$
60 sec for TO-3		300	
10 sec for SIP		260	

DEVICE SELECTION GUIDE

DEVICE	V_{IN} MAX	V_{OUT} MAX	CURRENT LIMIT	PACKAGE
LAS-6350	35	27	Fixed	TO-3
LAS-6350P1	35	27	Fixed	Plastic SIP
LAS-6351	35	27	Adjustable	TO-3
LAS-6351P1	35	27	Adjustable	Plastic SIP
LAS-6450	40	31	Fixed	TO-3
LAS-6450P	40	31	Fixed	Plastic SIP
LAS-6451	40	31	Adjustable	TO-3
LAS-6451P	40	31	Adjustable	Plastic SIP

BLOCK DIAGRAM



5 AMP SWITCHING REGULATORS

ELECTRICAL CHARACTERISTICS

Test conditions are as follows: $V_{CC} = 24V$, $V_O = 5V$, $I_O = 5A$, $C_T = 0.0056\mu F$,
 $T_J = 25^\circ C$, unless otherwise specified. $F_{SX} = 55 KHz$.

Parameter	Symbol	Test Conditions			Test Limits			Units
		V_{CC}	I_O	T_J^2	Minimum	Typical	Maximum	
REFERENCE SECTION								
Reference Voltage ¹ LAS-6300	V_{REF}	12 to V_{IN} (max)	0.5A to 5A	Over Temp	2.137 2.10	2.25	2.363 2.43	Volts Volts
LAS-6400					2.08		2.45	
Load Regulation ¹	$REG_{(LOAD)}$		0.5A to 5A			0.4	1.0	% V_{REF}
Line Regulation ¹	$REG_{(LINE)}$	12V to V_{IN} (max)				0.9	1.0	% V_{REF}
Temperature Coefficient	T_C			Over Temp		0.01		%/ $^\circ C$
OSCILLATOR SECTION								
Initial Frequency Accuracy	F_{SX}				-33	± 10	+33	%
Line Regulation of Frequency ¹	$REG_{(LINE)}$	12V to V_{IN} (max)				0.12	2.7	% F_{SX}
Frequency Temperature Coefficient	T_C			Over Temp		0.05		%/ $^\circ C$
Sawtooth Duty Cycle	d.c.					85		%
ERROR AMPLIFIER SECTION								
Input Offset Voltage						± 5		mV
Transconductance						2.7		mA/V
Output Sink/Source Current						0.26		mA
Input Common Mode Range					1.5		3.0	Volts
Open Loop Voltage Gain					50	60		dB
OUTPUT SECTION								
Peak Current Limit Knee	I_P			Over Temp	5.5			Amps
Short Circuit Current Limit	I_{SC}					9.5		Amps
Output Saturation Voltage	V_O (sat)	$C_O = V_{CC}$ $C_O = V_{CC}$ $E_O = GND$ $E_O = GND$	2A			2.0 2.4	2.6	Volts Volts Volts Volts
			5A			1.2		
			2A			1.6		
			5A			1.8		
Efficiency ³	η			Over Temp	70 65	79		% %
Current Rise Time ³	t_R	Inductive Load				50	100	nS
Current Fall Time ³	t_F	Inductive Load				700	900	nS
CONTROL PIN								
Output inhibit					0.64	0.75	1.06	Volts
Quiescent Current	I_Q	Output E_O Off				18		mA
		Output E_O On					30	mA

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

Die temperature changes must be accounted for separately.

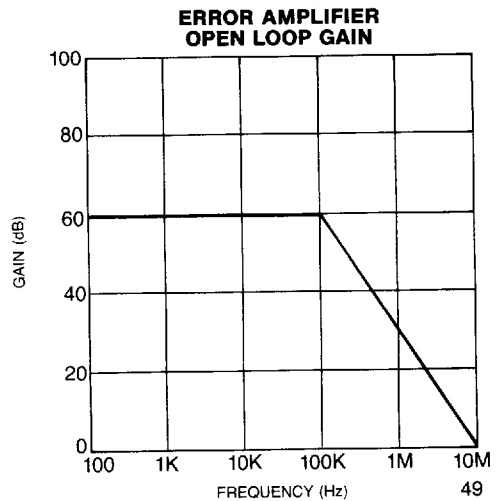
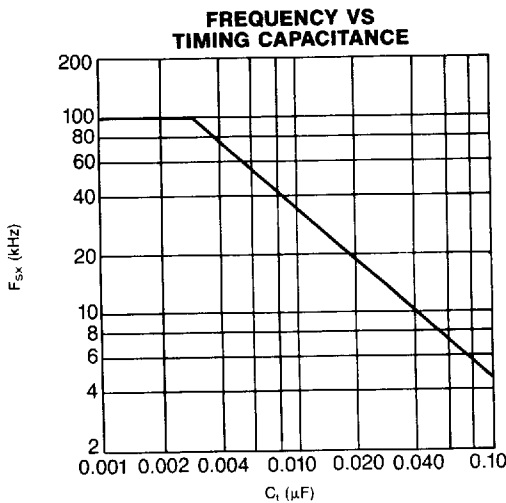
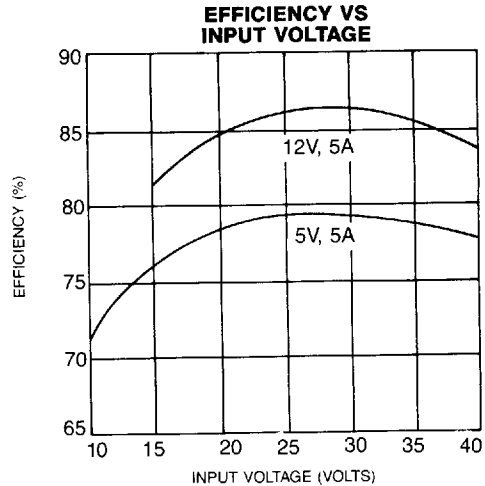
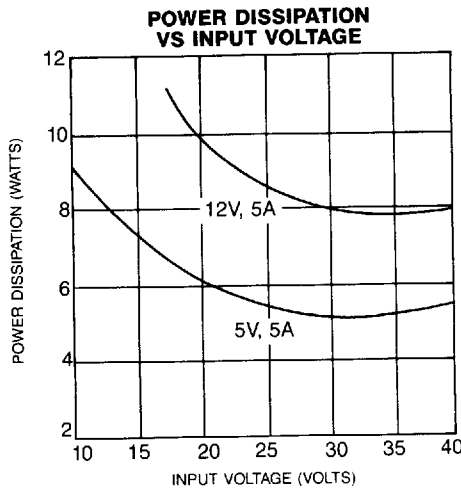
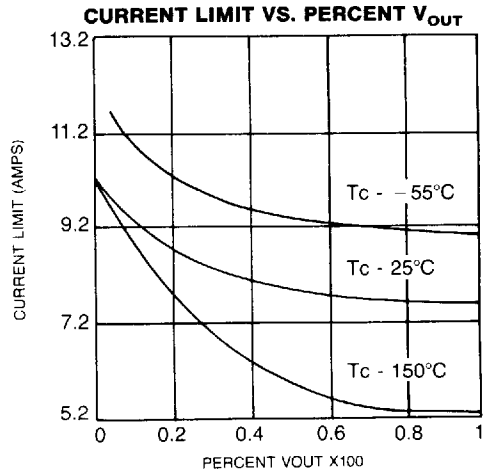
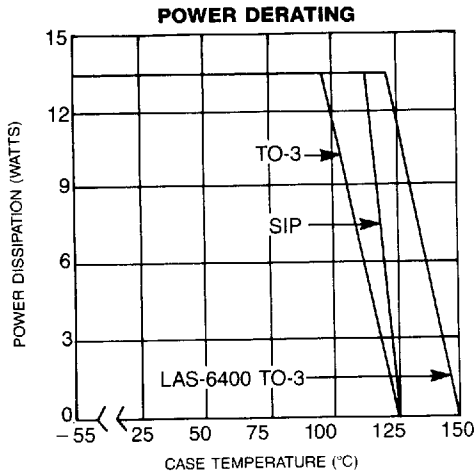
(2) Over Temperature, $T_J = -25^\circ C$ to $125^\circ C$ for LAS-6300 TO-3, SIP; LAS-6400 SIP, and $-55^\circ C$ to $150^\circ C$ for LAS-6400 TO-3.

(3) Per Test Circuit.

5 AMP SWITCHING REGULATORS

OPERATIONAL DATA

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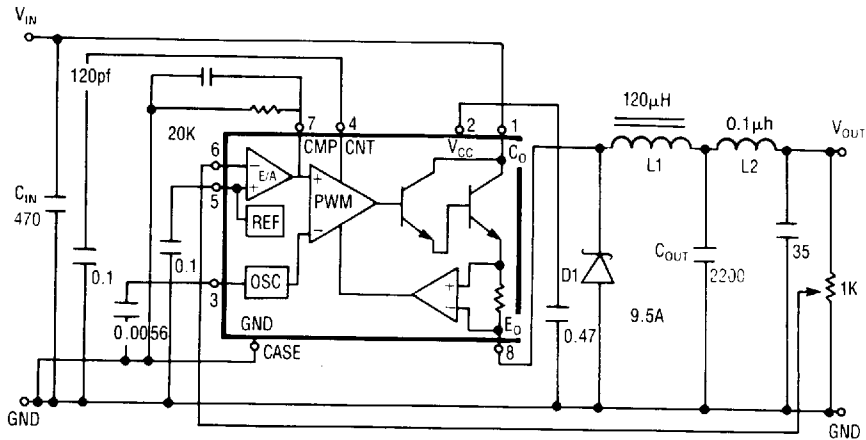
LAS-6350
LAS-6450

5 AMP SWITCHING REGULATORS

TYPICAL APPLICATIONS

11

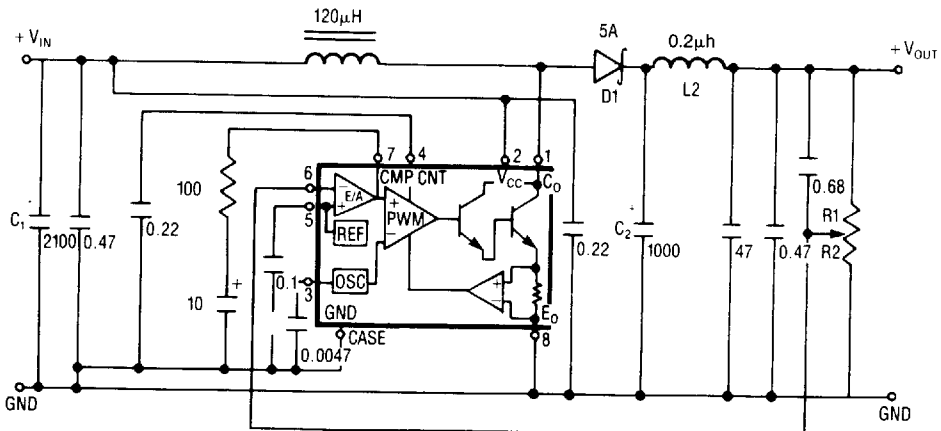
DC-TO-DC STEP-DOWN CONVERTER



$$V_{IN} = 24V$$

$$V_{OUT} = 5V @ 5A$$

DC-TO-DC STEP-UP CONVERTER



$$V_{IN} = 12V$$

$$V_{OUT} = 24V @ 1.5A$$

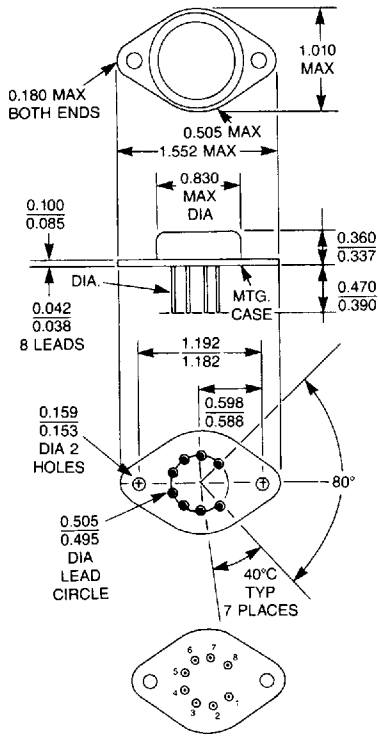
LAS-6350
LAS-6450

5 AMP SWITCHING REGULATORS

DEVICE OUTLINE

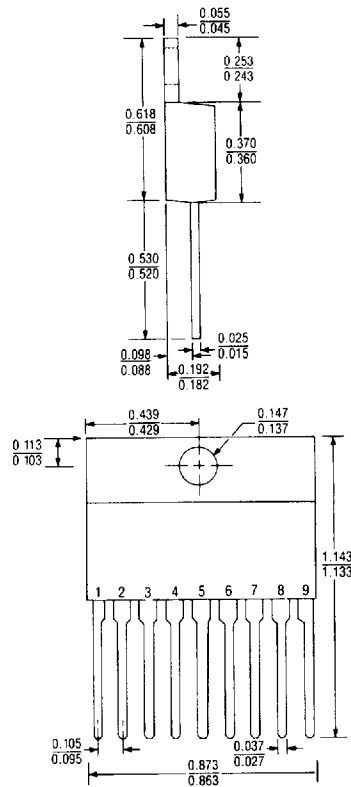
11

LAS-6X50, 6X51



Bottom View

LAS-6X50P, 6X51P



Front View

LAS-6X50P

- 1 - C_O
- 2 - V_{CC}
- 3 - C_t
- 4 - CNT
- 5 - V_{REF}
- 6 - E_{rr}(-)
- 7 - CMP
- 8 - E_O
- Case is Ground

LAS-6X51P

- 1 - C_O/V_{CC}
- 2 - C_t
- 3 - CNT
- 4 - V_{REF}
- 5 - E_{rr}(-)
- 6 - CMP
- 7 - CLS
- 8 - E_O
- Case is Ground

LAS-6X50P

- 1 - C_O
- 2 - V_{CC}
- 3 - C_t
- 4 - CNT
- 5 - GND
- 6 - V_{REF}
- 7 - E_{rr}(-)
- 8 - CMP
- 9 - E_O
- Tab is Ground

LAS-6X51P

- 1 - C_O/V_{CC}
- 2 - C_t
- 3 - CNT
- 4 - V_{REF}
- 5 - GND
- 6 - E_{rr}(-)
- 7 - CMP
- 8 - CLS
- 9 - E_O
- Tab is Ground

NOTE: All dimensions are in inches.