

8 AMP SWITCHING REGULATORS

LAS 6380 SERIES

T-58-11-31

FEATURES

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

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MAXIMUM	UNITS
Control Circuit Voltage	V_{CC}	35	Volts
Output Collector Voltage	C_O	35	Volts
Power Dissipation	P_D	Internally Limited	Watts
Thermal Resistance Junction to Case LAS 6380&6381 LAS 6380P1&6381P1	θ_{JC}	1.5 0.8	$^{\circ}C/W$
Operating Junction and Storage Temperature Range	T_J T_{STG}	- 25 to 125	$^{\circ}C$
Lead Temperature (Soldering) 60 sec for TO-3 10 sec for SIP	T_{LEAD}	300 260	$^{\circ}C$

DEVICE SELECTION GUIDE

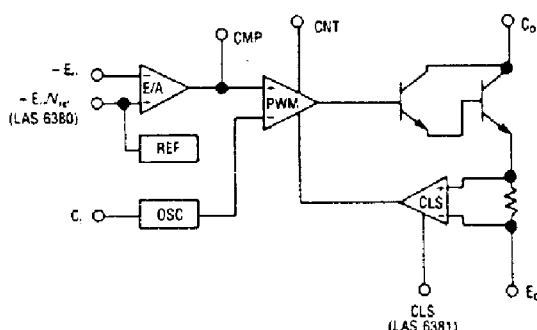
DEVICE	CURRENT LIMIT	PACKAGE
LAS 6380	Fixed	TO-3
LAS 6381	Adjustable	TO-3
LAS 6380P1	Fixed	Plastic SIP
LAS 6381P1	Adjustable	Plastic SIP

DESCRIPTION

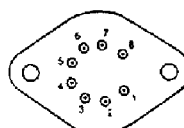
The LAS 6380 Series are monolithic integrated circuits designed for fixed frequency, pulse width modulated, switching converter applications such as step-down, step-up, flyback, forward, Cuk and voltage inverting DC-to-DC converters and motor controls. The LAS 6380 Series includes a temperature compensated voltage reference, sawtooth oscillator with over-current frequency shift, linear trailing edge pulse width modulator with double pulse suppression logic, transconductance error amplifier, and an 8 amp Darlington output transistor with internal current limit protection.

The LAS 6380 & 6380P1 can be used in step-down or step-up applications. The LAS 6381 & LAS 6381P1 are for step-down applications where current limit adjustment is necessary. The LAS 6380 Series is available in TO-3 steel packages for true hermetic seal and board insertable plastic SIP packages.

BLOCK DIAGRAM



LAS6380



Bottom View

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

LAS6381

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

LAS6380P1

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

LAS6381P1

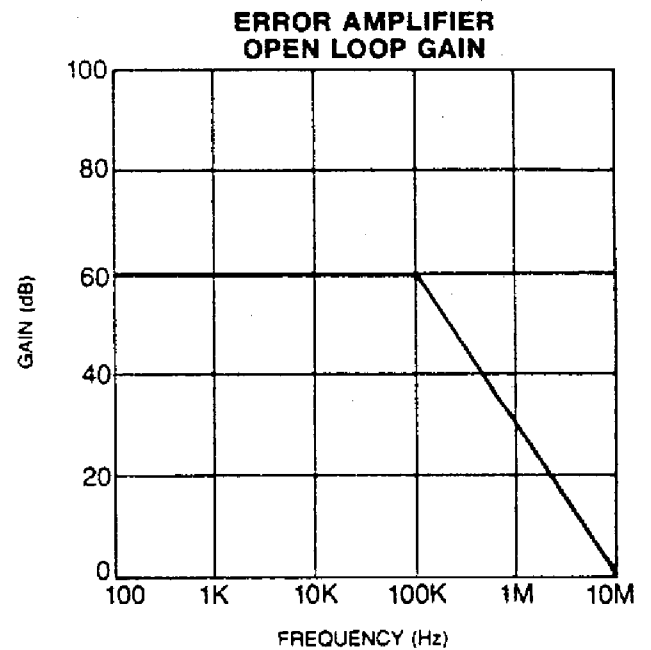
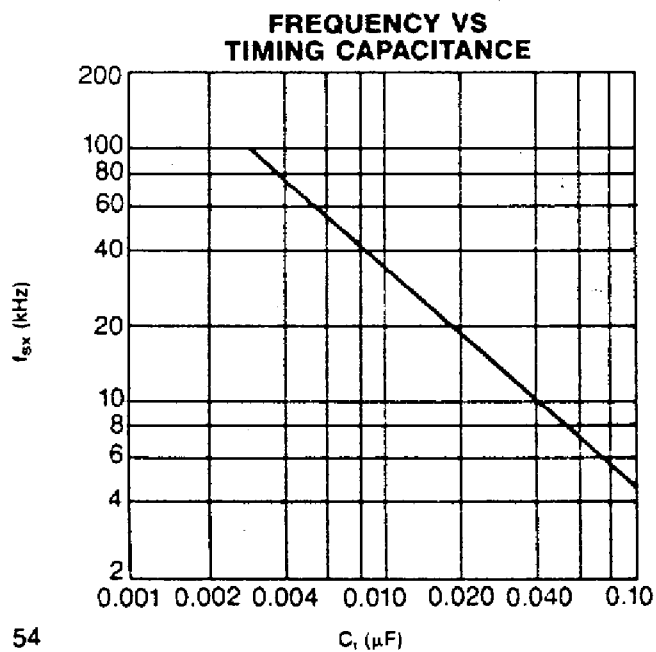
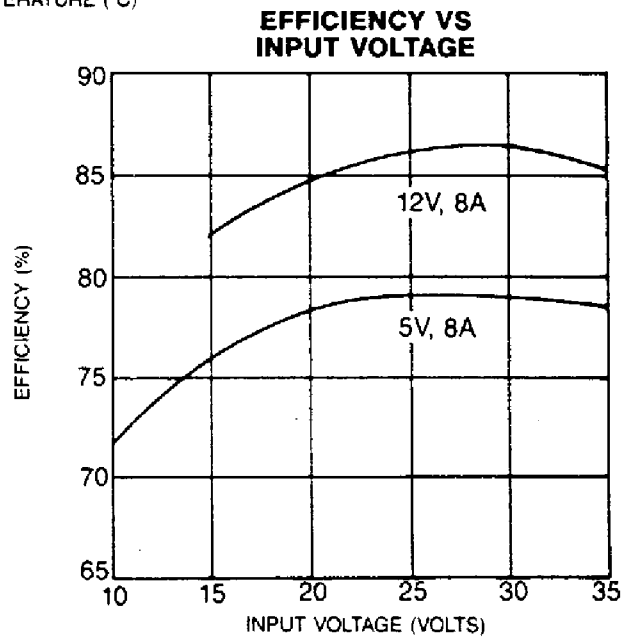
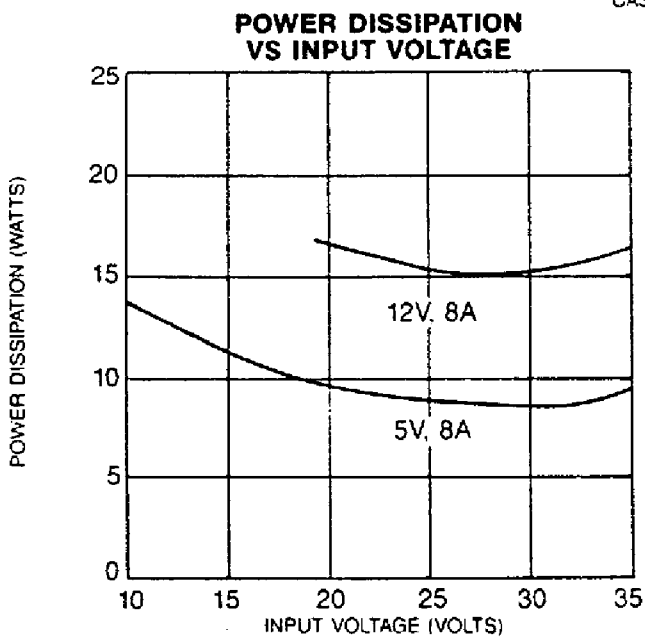
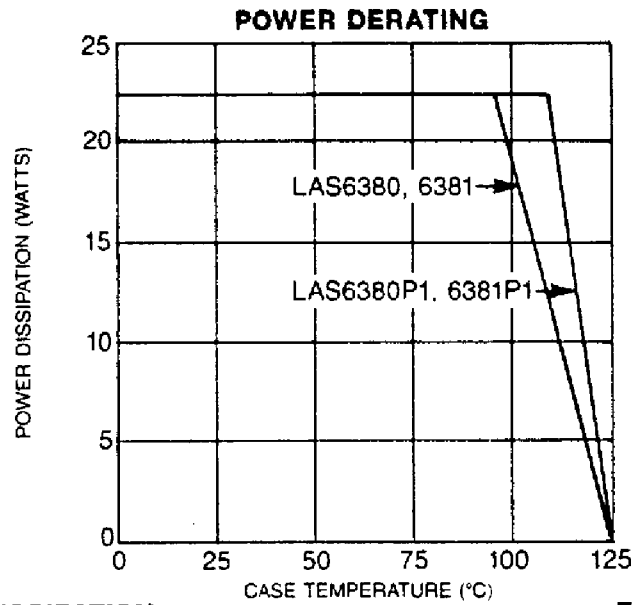
- 1 - C_O/V_{CC}
- 2 - C_I
- 3 - CNT
- 4 - V_{REF}
- 5 - GND
- 6 - $E_{rr}(-)$
- 7 - CMP
- 8 - CLS
- 9 - E_O
- Tab is Ground

ELECTRICAL CHARACTERISTICS

Test conditions are as follows: $V_{CC} = 24V$, $V_O = 5V$, $I_O = 8A$, $C_t = 0.0056\mu F$,
 $T_J = 25^\circ C$, unless otherwise specified.

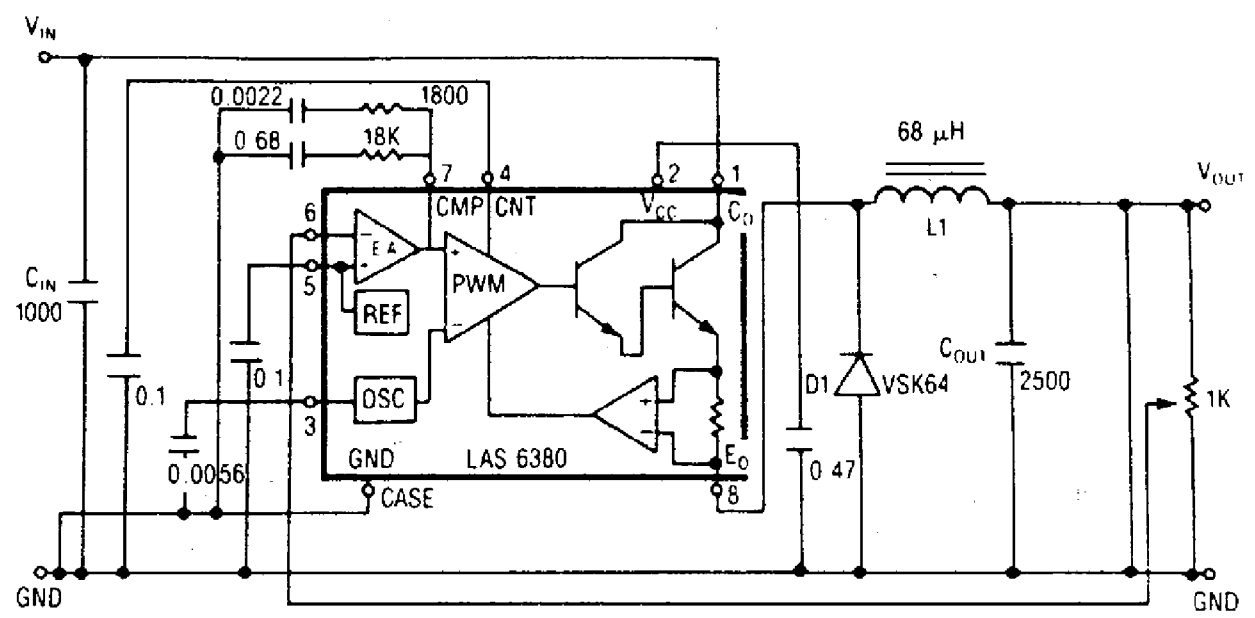
Parameter	Symbol	Test Conditions			Test Limits			Units
		V _{CC}	I _O	T _J	Minimum	Typical	Maximum	
REFERENCE SECTION								
Reference Voltage	V _{REF}				2.137	2.25	2.363	Volts
Line Regulation	REG _(LINE)	12V to 30V				0.015	0.04	%/V
Temperature Coefficient	T _C			0 to 125°C		0.01	0.02	%/°C
OSCILLATOR SECTION								
Initial Frequency Accuracy					− 33	± 10	+ 33	%
Line Regulation of Frequency	REG _(LINE)	12V to 30V				0.1	0.15	%/V
Frequency Temperature Coefficient	T _C			0 to 125°C		0.05		%/°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 Switching Current Limit	I _{CL}				9	11	13	Amps
Output Saturation Voltage	V _O (sat)	C _O = V _{CC} C _O = V _{CC} E _O = GND E _C = GND	4A 8A 4A 8A			1.6 2.1 0.9 1.4	2.5	Volts Volts Volts Volts
Efficiency	η				70	75		%
Current Rise Time	t _R	Inductive Load				50	100	nS
Current Fall Time	t _F	Inductive Load				700	900	nS
CONTROL PIN								
Output Inhibit					0.64	0.75	1.06	Volts
Quiescent Current	I _O	V _O = 0V				18	30	mA

OPERATIONAL DATA



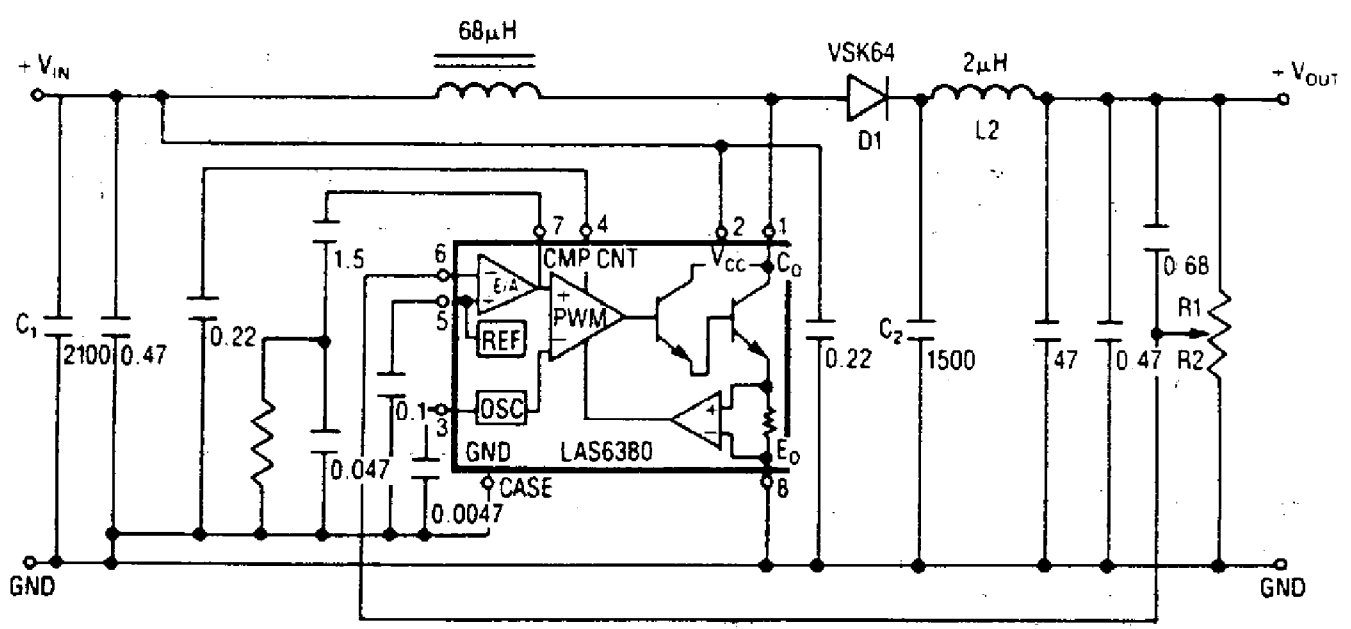
TYPICAL APPLICATIONS

DC-TO-DC STEP-DOWN CONVERTER



$V_{IN} = 24V$
 $V_{OUT} = 5V @ 8A$

DC-TO-DC STEP-UP CONVERTER

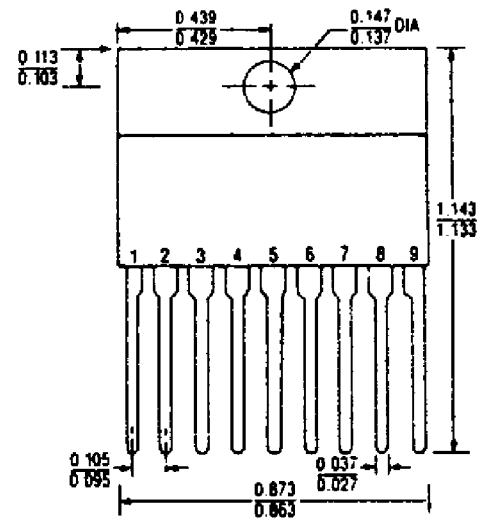
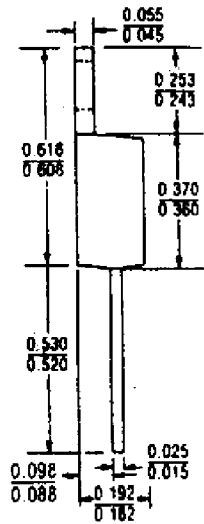
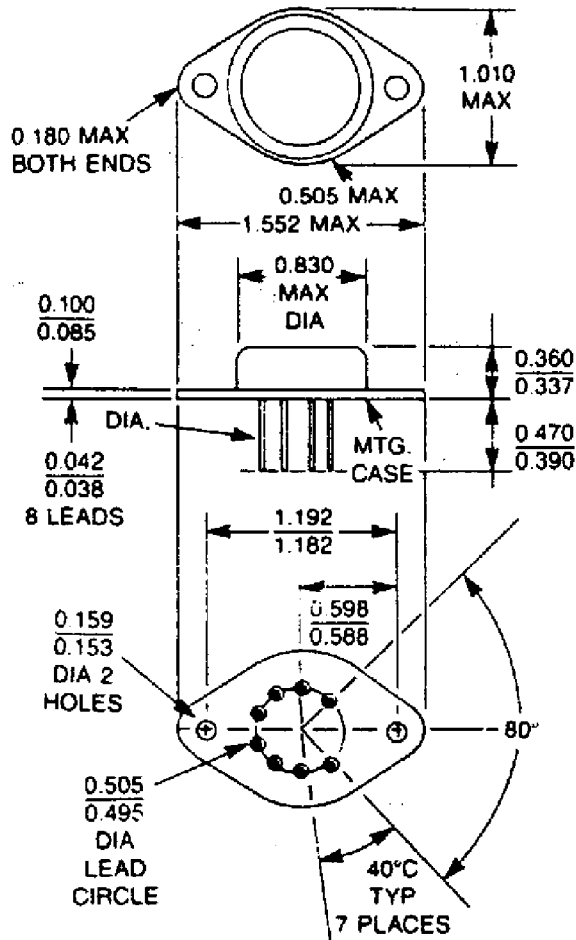


$V_{IN} = 12V$
 $V_{OUT} = 24V @ 2.5A$

DEVICE OUTLINE

LAS6380, 6381

LAS6380P1, 6381P1



Front View

NOTE: All dimensions are in inches.