



LAMBDA SEMICONDUCTORS

LAS 6380, LAS 6480, LAS 6580
8 AMP SWITCHING REGULATORS

FEATURES

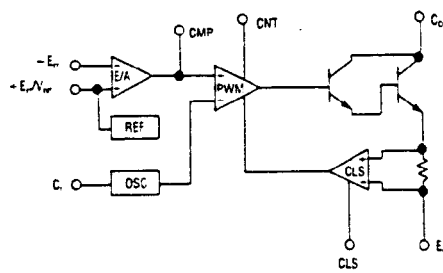
- DC to 100 kHz operation
- Adjustable output voltage
- Cycle-by-cycle current limit
- Internal thermal shutdown
- Inhibit/enable control pin

DESCRIPTION

The LAS 6380/6480/6580 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 6380/6480/6580 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, trans-conductance error amplifier, and a 8 amp Darlington output transistor with internal current limit protection.

The LAS 6380/6480/6580 can be used in step-down or step-up applications. The LAS 6381/6481/6581 are for step-down applications where current limit adjustment is necessary. The LAS 6380/6480/6580 Series is available in TO-3 steel packages for true hermetic seal and board insertable plastic SIP packages.

BLOCK DIAGRAM



PRELIMINARY
8/30/88

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MAXIMUM	UNITS
Control Circuit/ Output Collector Voltage LAS 6380/81 LAS 6480/81 LAS 6580/81	V_{CC} / C_O C_O	35 40 45	Volts
Power Dissipation	P_D	Internally Limited	Watts
Thermal Resistance Junction to Case TO-3 SIP	θ_{JC}	1.5 0.8	$^{\circ}\text{C/W}$
Operating Junction and Storage Tempera- ture Range	T_J T_{STG}	-25 to 125	$^{\circ}\text{C}$
Lead Temperature (Soldering) 60 sec for TO-3 10 sec for SIP	T_{LEAD}	300 260	$^{\circ}\text{C}$

DEVICE SELECTION GUIDE

DEVICE	V_{IN} MAX	V_{OUT} MAX	CURRENT LIMIT	PACKAGE
LAS 6380	35	27	Fixed	TO-3
LAS 6380P1	35	27	Fixed	Plastic SIP
LAS 6381	35	27	Adjustable	TO-3
LAS 6381P1	35	27	Adjustable	Plastic SIP
LAS 6480	40	30	Fixed	TO-3
LAS 6480P1	40	30	Fixed	Plastic SIP
LAS 6481	40	30	Adjustable	TO-3
LAS 6481P1	40	30	Adjustable	Plastic SIP
LAS 6580	45	35	Fixed	TO-3
LAS 6580P1	45	35	Fixed	Plastic SIP
LAS 6581	45	35	Adjustable	TO-3
LAS 6581P1	45	35	Adjustable	Plastic SIP

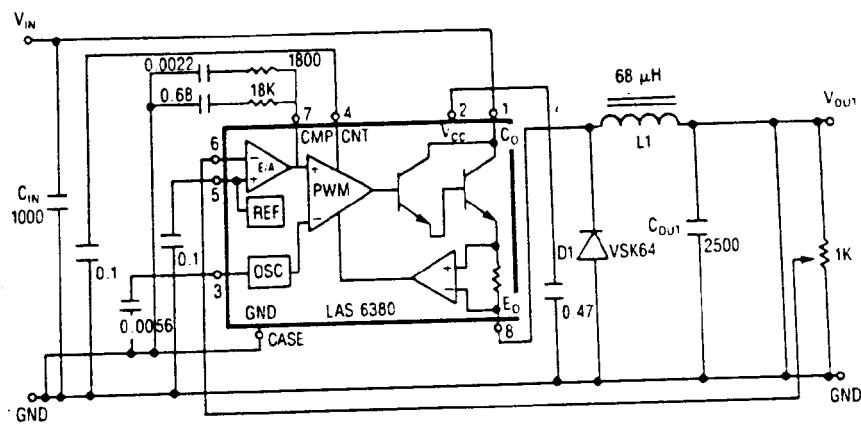
ELECTRICAL CHARACTERISTICS

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 V _{IN(MAX)}				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 V _{IN(MAX)}				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 _O = GND	4A 8A 4A 8A			1.6 2.1 0.9 1.4	2.5 1.8	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

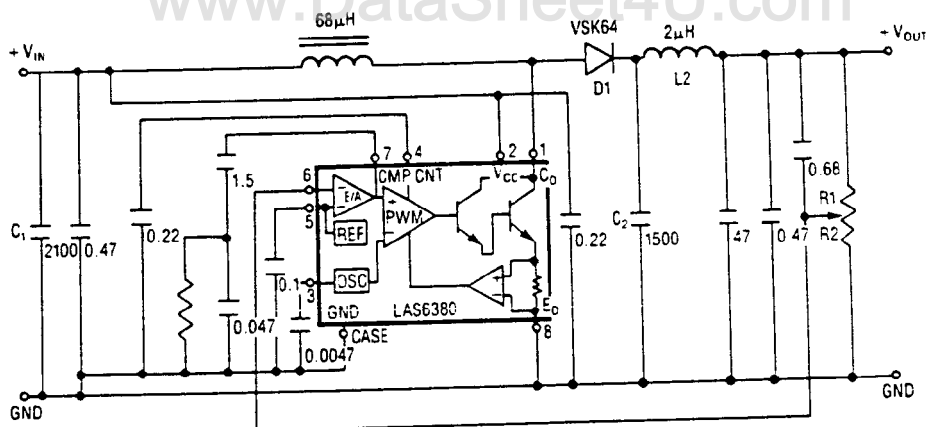
TYPICAL APPLICATIONS

DC-TO-DC STEP-DOWN CONVERTER



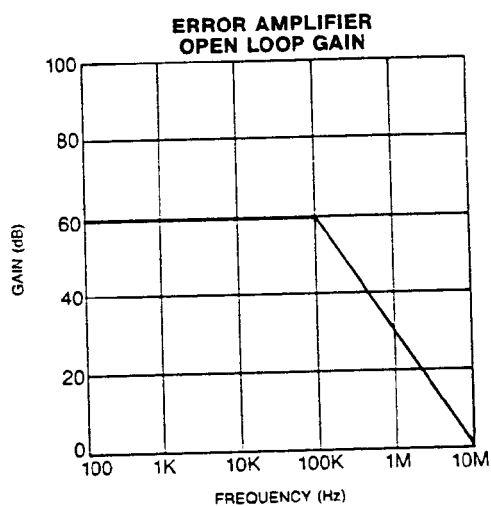
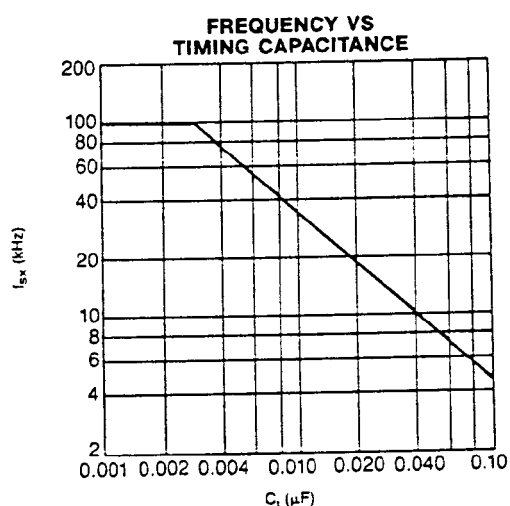
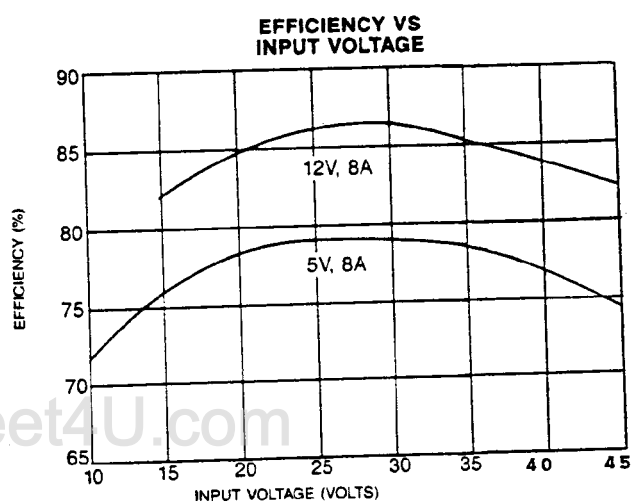
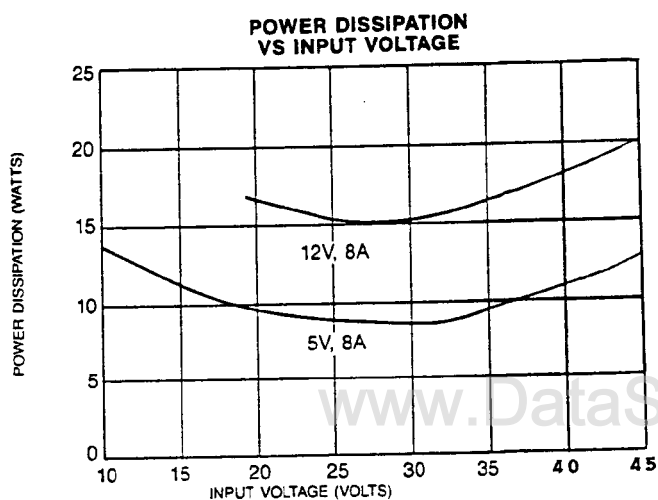
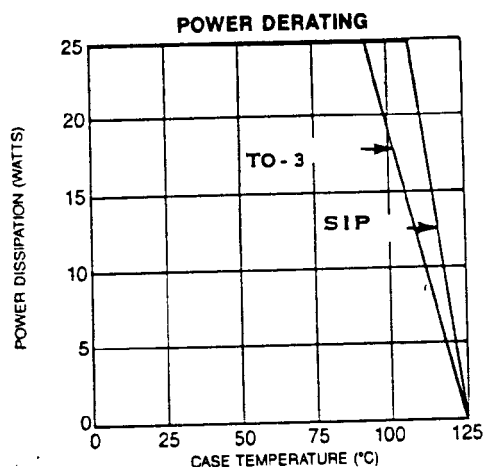
$V_{IN} = 24V$
 $V_{OUT} = 5V @ 8A$

DC-TO-DC STEP-UP CONVERTER



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

OPERATIONAL DATA



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