

M62290L/FP

5.0V FIXED OUTPUT VOLTAGE DC-DC CONVERTER

GENERAL DESCRIPTION

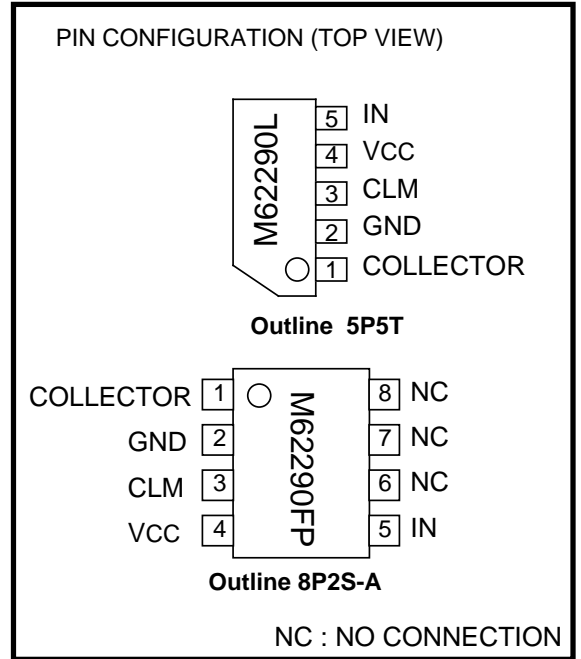
The M62290L/FP is a general purpose DC-DC converter which provides 5.0V fixed output.
 It is possible to simplify peripheral circuits and to design compact and low cost sets because this IC includes a lot of functions in small 5- or 8-pin packages.
 Especially this is most suitable for a local voltage regulator of audio sets as a converter from 12V to 5V.

FEATURES

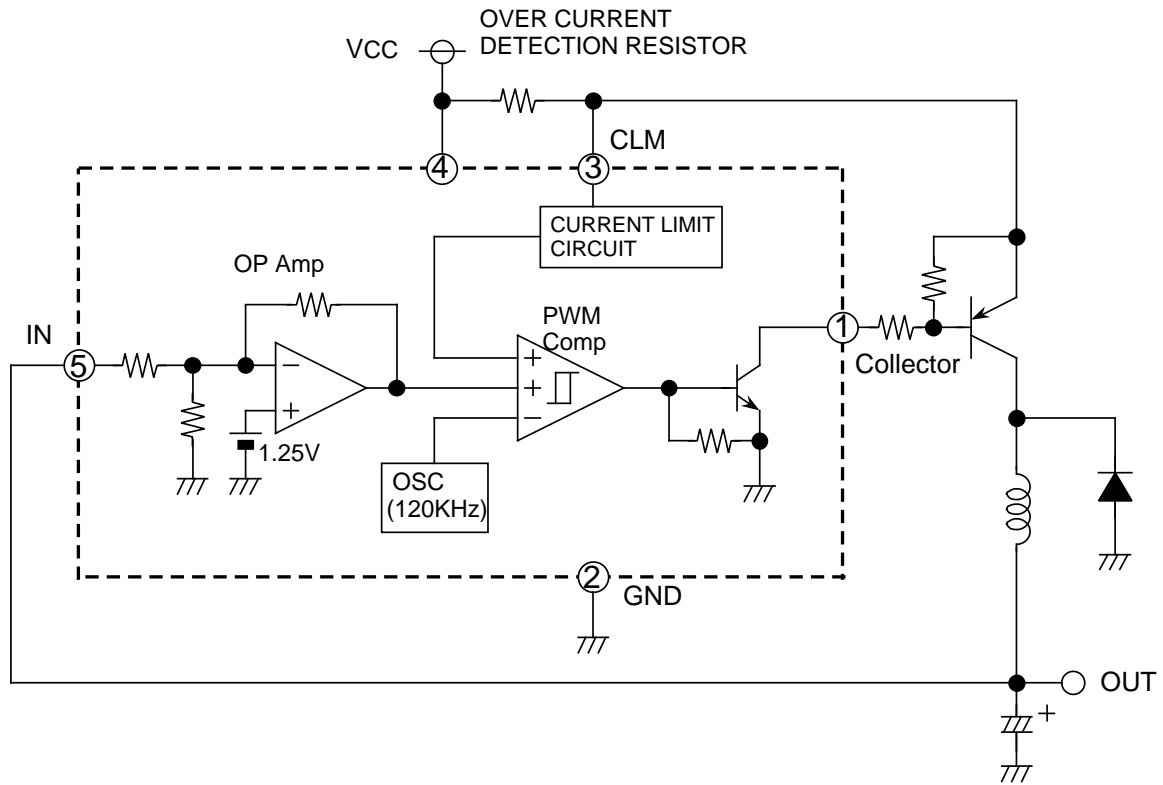
- Wide operation voltage range 6 to 15 V (typ. $V_{CC}=12V$)
- Low power dissipation 1.1mA (max., $V_{CC}=12V$)
- Built-in oscillator without peripheral devices (120KHz typ.)
- Built-in over current protection circuit
- Small 5-pin SIP and 8-pin SOP packages

APPLICATIONS

Local voltage regulator of audio sets and general electric products



BLOCK DIAGRAM



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ABSOLUTE MAXIMUM RATINGS (Ta=25°C, unless otherwise noted)

Symbol	Parameter	Conditions		Ratings	Unit
Vcc	Supply voltage			16	V
Io	Output current			100	mA
Pd	Power dissipation	Ta = 25°C	5-pin SIP	450	mW
			8-pin SOP	440	mW
Kθ	Thermal derating	Ta > 25°C	5-pin SIP	4.5	mW/ °C
			8-pin SOP	4.4	mW/ °C
Topr	Operating temperature			-20 to +85	°C
Tstg	Storage temperature			-40 to +125	°C

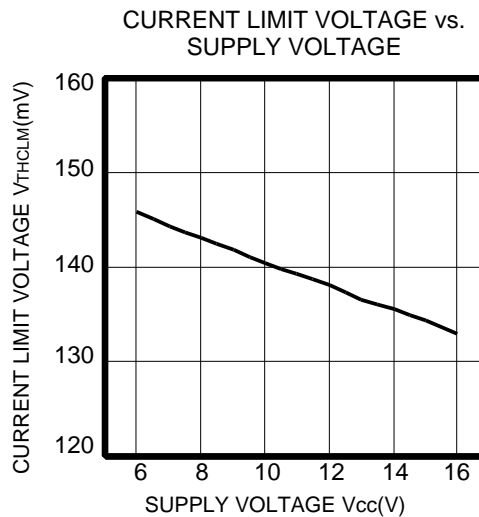
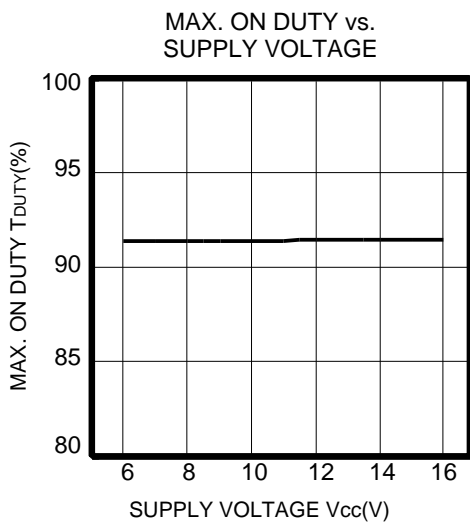
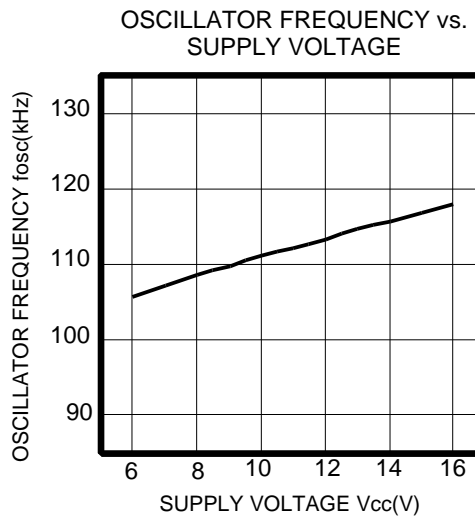
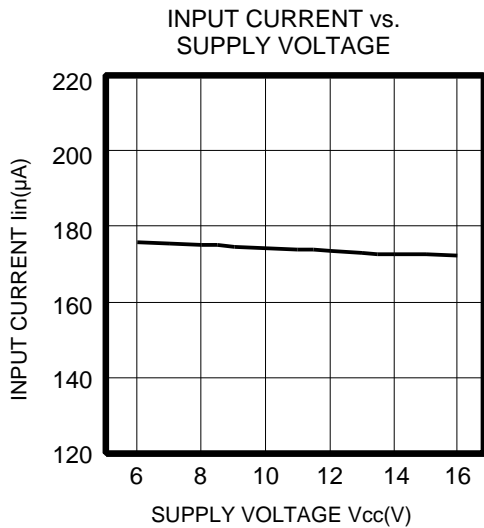
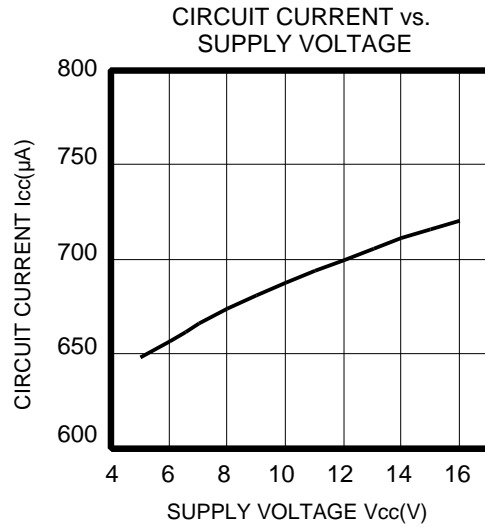
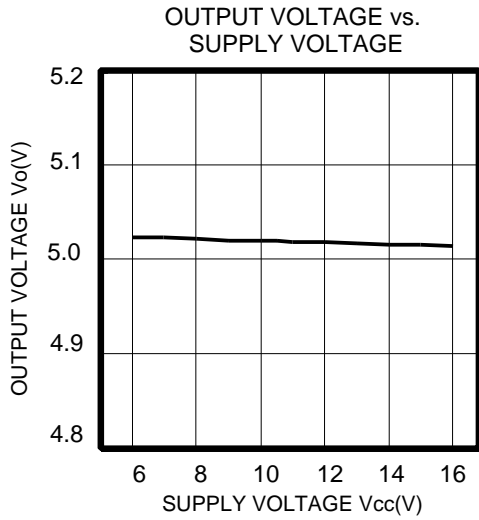
ELECTRICAL CHARACTERISTICS (Ta=25°C, Vcc=12V, unless otherwise noted)

Block	Symbol	Parameter	Test conditions	Limits			Unit
				Min.	Typ.	Max.	
All block	Vcc	Supply voltage		6.0		15	V
	Icc	Supply current	Without load	—	780	1100	μA
Error Amp.	Vo	Output voltage		4.75	5.00	5.25	V
	Vreg-L	REF line regulation	Vcc= 6 to 15V		5	30	mV
	Iin	IN input current		—	160	300	μA
Oscillator	fosc	Oscillator frequency		70	120	170	kHz
	TDUTY	Maximum on duty			90		%
CLM	VTHCLM	Current limit voltage	Vcc - CLM	110	140	170	mV
Output	ICL	Output leakage current	Vcc = 15V, Vc = 15V	-1	—	1	μA
	Vsat	Output saturation voltage	Io = 100mA	—	0.1	0.3	V

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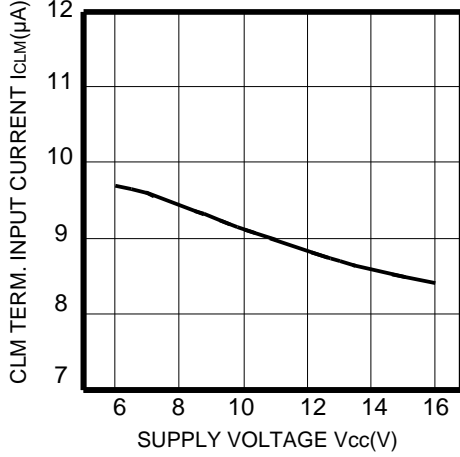
TYPICAL CHARACTERISTICS



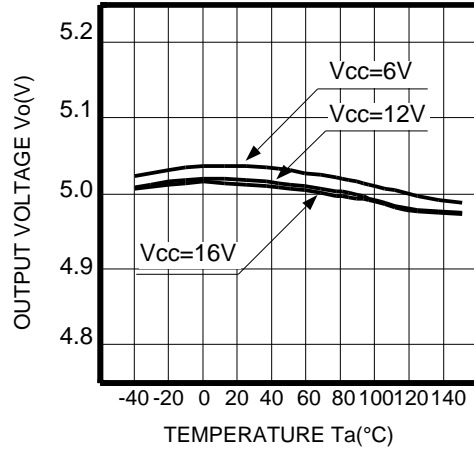
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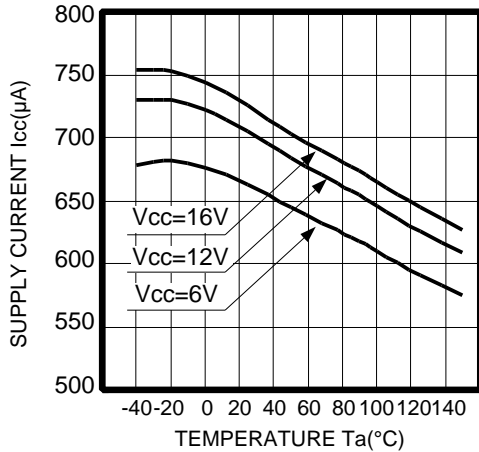
CLM TERM. INPUT CURRENT vs. SUPPLY VOLTAGE



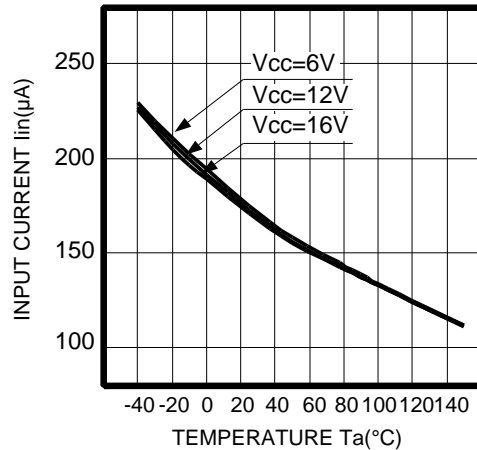
OUTPUT VOLTAGE vs. TEMPERATURE



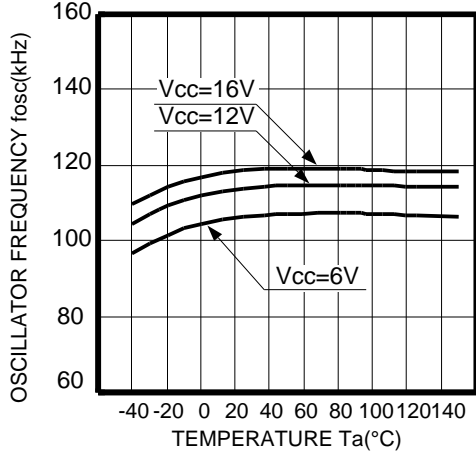
SUPPLY CURRENT vs. TEMPERATURE



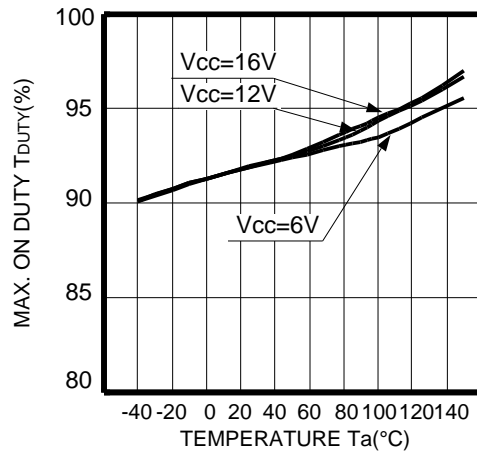
INPUT CURRENT vs. TEMPERATURE



OSCILLATOR FREQUENCY vs. TEMPERATURE

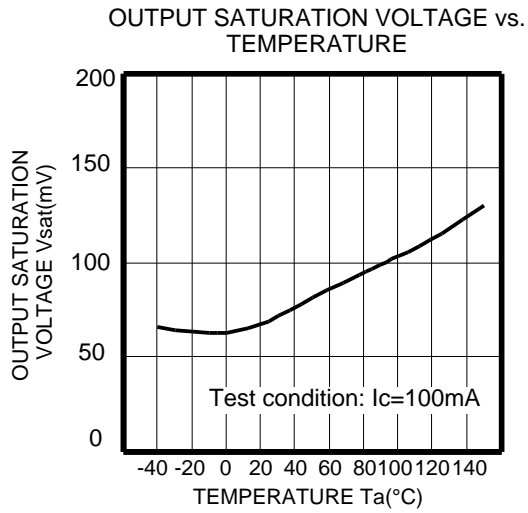
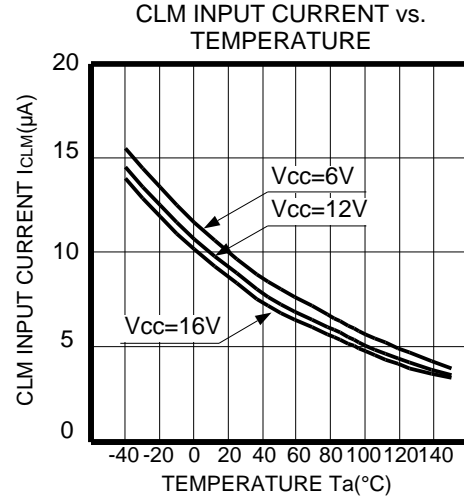
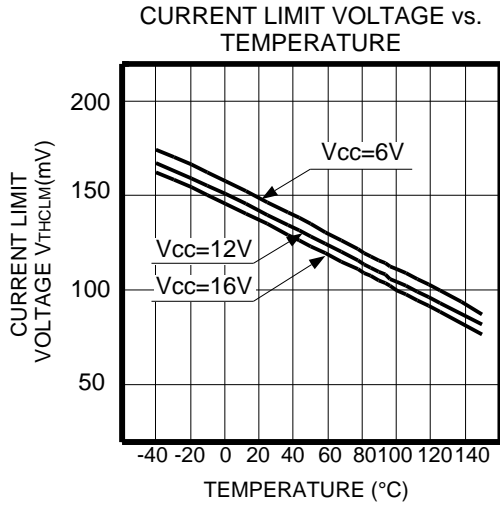


MAX. ON DUTY vs. TEMPERATURE



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Application Circuit (5V Output DC-DC converter)

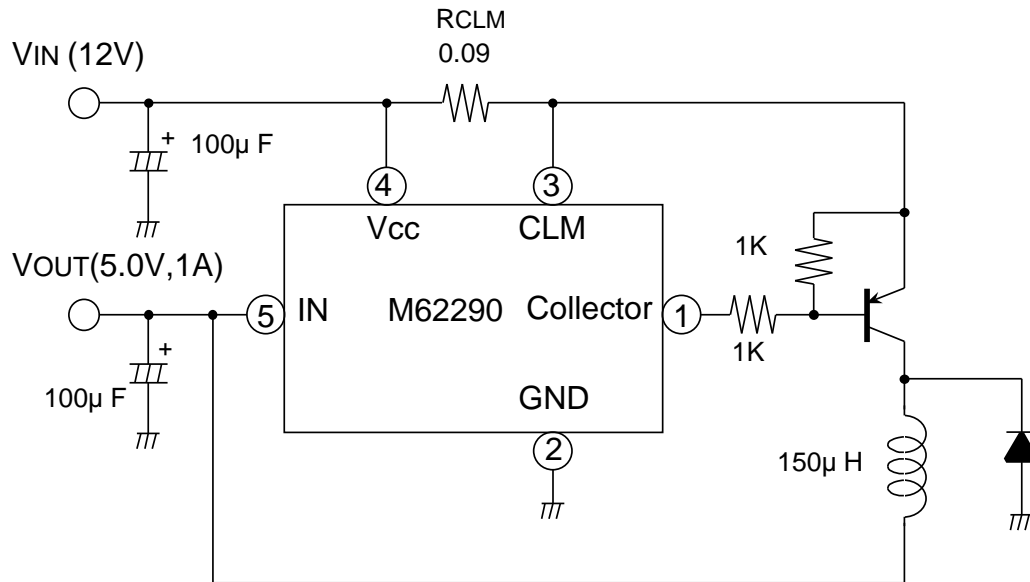


Fig.1 Example of application circuit of the M62290L/FP

•Current Limit Detection:

When the voltage drop between pin 3 and 4 becomes more than 140mV, the Current Limit Detection circuit begins operating. The peak switch current "Ipk" is limited to 140mV / RCLM. In the example of application (fig.1), the current is limited to 1.5A.

The Expression of Circuit Constants

CONSTANTS	EXPRESSIONS
$\frac{TON}{TOFF}$	$\frac{VO+VF}{VIN - VCE(sat) - VO}$
(TON+TOFF)MAX	$\frac{1}{fosc}$ fosc:120KHz(Vcc=12V)
TOFF(MIN)	$(TON + TOFF) / (1 + \frac{TON}{TOFF})$
TON(MAX)	$\frac{1}{fosc} - TOFF$
L(MIN)	$\frac{(VIN - VCE(sat) - VO) \times TON(MAX)}{Io}$
Ipk	$Io + \frac{1}{2} Io$
RCLM	$\frac{0.14}{Ipk}$ VCLM:140mV(Vcc=12V)

- VF : Forward voltage drop of an external diode.
- Vsat : Output saturation voltage of an external switching transistor.
- Io : Set between 1/3 and 1/5 of the maximum output current.
- An external transistor, diode and inductor must have a peak current capability of approximately greater than "Ipk".

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Application circuit characteristics

