DS1088C

固定频率EconOscillator™

概述

DS1088C低成本时钟发生器无需外部定时元件，即可输出方波。固定频率振荡器经过工厂校准，工作在133MHz频率。器件具有关断引脚，适用于功耗敏感应用。
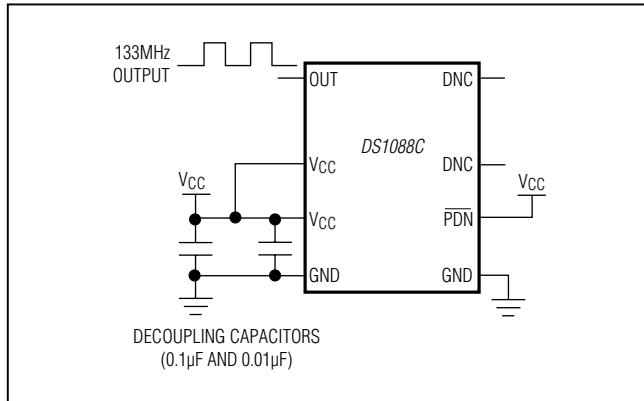
应用

打印机

复印机

汽车远程信息处理

计算机外设

POS终端

电缆调制解调器

定购信息在数据资料的最后给出。

特性

♦ 工厂编程，133MHz方波发生器

♦ 单输出

♦ 无需外部定时元件

♦ 2.7V至3.6V供电

♦ 关断模式

♦ 宽工作温度范围(-20°C至+85°C)

典型工作电路

DECOUPLING CAPACITORS
(0.1μF AND 0.01μF)

EconOscillator是Maxim Integrated Products, Inc.的商标。

相关型号以及配合该器件使用的推荐产品，请参见：china.maximintegrated.com/DS1088C.related。

本文是英文数据资料的译文，文中可能存在翻译上的不准确或错误。如需进一步确认，请在您的设计中参考英文资料。

有关价格、供货及订购信息，请联络Maxim亚洲销售中心：10800 852 1249 (北中国区)，10800 152 1249 (南中国区)，或访问Maxim的中文网站：china.maximintegrated.com。

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ABSOLUTE MAXIMUM RATINGS

(Voltages relative to ground.)
Voltage Range on V_CC...-0.5V to +6.0V
Voltage Range on $\overline{PDN}$ .... -0.5V to (V_CC + 0.5V)*
Operating Temperature Range.......................... -20°C to +85°C

Storage Temperature Range............................ -55°C to +125°C
Lead Temperature (TDFN only; soldering, 10s) ....+300°C
Soldering Temperature (reflow) ....+260°C

*Not to exceed +6.0V.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

RECOMMENDED OPERATING CONDITIONS

(T_A = -20°C to +85°C, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Supply Voltage	V_CC	(Note 1)	2.7		3.6	V
High-Level Input Voltage ($\overline{PDN}$)	V_IH		0.7 x V_CC		V_CC + 0.3	V
Low-Level Input Voltage ($\overline{PDN}$)	V_IL		-0.3		0.3 x V_CC	V

DC ELECTRICAL CHARACTERISTICS

(V_CC = 2.7V to 3.6V, T_A = -20°C to +85°C, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
High-Level Output Voltage (OUT)	V_OH	I_OH = -4mA, V_CC = MIN	V_CC - 0.4			V
Low-Level Output Voltage (OUT)	V_OL	I_OL = 4mA			0.4	V
High-Level Input Current ($\overline{PDN}$)	I_IH	V_CC = 3.6V			1	µA
Low-Level Input Current ($\overline{PDN}$)	I_IL	V_IL = 0V	-1			µA
Supply Current (Active)	I_CC	V_CC = 3.6V, C_L = 15pF, f_O = 133MHz		15	24	mA
Standby Current (Power-Down)	I_CCQ	Power-down mode			10	µA

OSCILLATOR CHARACTERISTICS—TDFN

(V_CC = 2.7V to 3.6V, T_A = -20°C to +85°C, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNITS
Output Frequency Range Available	f_O				133.3		MHz
Output Frequency Tolerance	$\frac{\Delta f_O}{f_O}$	V_CC = 3.3V, T_A = +25°C (Note 2)		-0.3		+0.3	%
Voltage Frequency Variation	$\frac{\Delta f_V}{f_O}$	Over voltage range, T_A = +25°C (Note 3)		-0.35		+0.35	%
Temperature Frequency Variation	$\frac{\Delta f_T}{f_O}$	Over temperature range, V_CC = 3.3V (Notes 4, 5)	-20°C to +25°C	-0.7		+0.7	%
			+25°C to +85°C	-0.5		+0.5	
Frequency Variation Over Voltage and Temperature	$\frac{\Delta f_{V,T}}{f_O}$	Over voltage and temperature range		-1.0		+1.0	%

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OSCILLATOR CHARACTERISTICS—WLP

(V_{CC} = 2.7V to 3.6V, T_A = -20°C to +85°C, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNITS
Output Frequency	f_O				133.3		MHz
Output Frequency Tolerance	$\frac{\Delta f_O}{f_O}$	V_{CC} = 3.3V, T_A = +25°C (Note 2)		-3		+3	%
Voltage Frequency Variation	$\frac{\Delta f_V}{f_O}$	Over voltage range, T_A = +25°C (Note 3)		-3.5		+3.5	%
Temperature Frequency Variation	$\frac{\Delta f_T}{f_O}$	Over temperature range, V_{CC} = +3.3V (Notes 4, 5)	-20°C to +25°C	-7		+7	%
			+25°C to +85°C	-5		+5	
Frequency Variation Over Voltage and Temperature	$\frac{\Delta f_T}{f_O}$	Over voltage and temperature range		-10		+10	%

AC ELECTRICAL CHARACTERISTICS

(V_{CC} = 2.7V to 3.6V, T_A = -20°C to +85°C, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Power-Up Time	t_{POR} + t_{STAB}	(Note 6)			100	µs
OUT Disabled After Entering Power-Down Mode	t_{PDN}	(Note 7)			7	µs
Load Capacitance	C_L	(Note 8)		15	50	pF
Output Duty Cycle (OUT)			40		60	%

Note 1: All voltages are referenced to ground.
Note 2: Typical frequency shift due to aging is within ±0.2%. Aging stressing includes level 1 moisture reflow preconditioning (24hr +125°C bake, 168hr +85°C/85%RH moisture soak, and three solder reflow passes +240°C +0°C/-5°C peak) followed by1000hr (max) V_{CC} biased +125°C OP/L, 1000hr unbiased +150°C bake, 1000 temperature cycles at -55°C to +125°C and 168hr +121°C/2 ATM steam/unbiased autoclave.
Note 3: This is the change in output frequency due to changes in voltage at T_A = +25°C.
Note 4: Guaranteed by design.
Note 5: This is the change in output frequency due to changes in temperature from the +25°C frequency at V_{CC} = 3.3V.
Note 6: This indicates the time elapsed between power-up and the output becoming active. An on-chip delay is intentionally introduced to allow the oscillator to stabilize. t_{STAB} is equivalent to approximately 512 clock cycles and will depend on the programmed oscillator frequency.
**Note 7:** Output disabled in two cycles or less of the output frequency.
Note 8: Output voltage swings may be impaired at high frequencies combined with high-output loading.
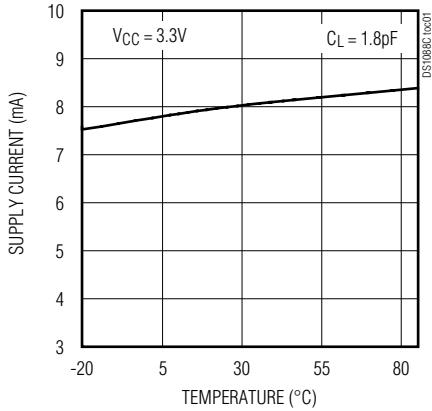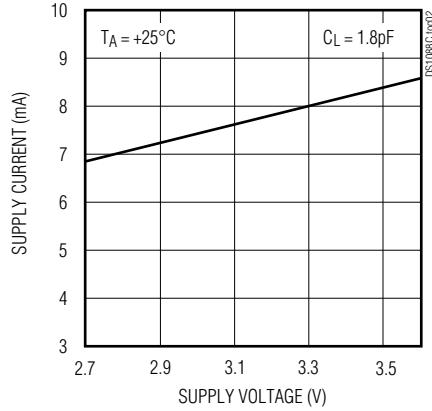
典型工作特性

(V_{CC} = 3.3V, T_A = +25°C, unless otherwise noted.)
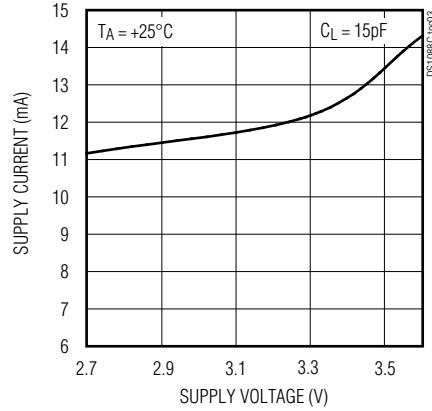
**ACTIVE SUPPLY CURRENT
vs. TEMPERATURE**
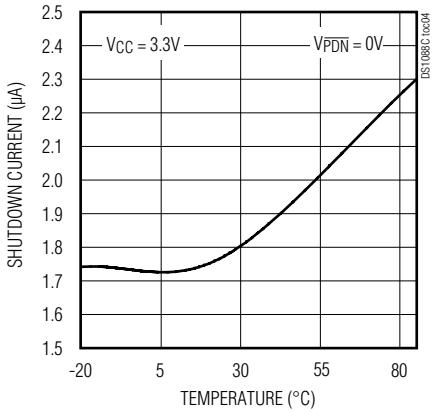
V_{CC} = 3.3V C_L = 1.8pF

DS1088C toc01

**ACTIVE SUPPLY CURRENT
vs. SUPPLY VOLTAGE**

T_A = +25°C C_L = 1.8pF

DS1088C toc02

**ACTIVE SUPPLY CURRENT
vs. SUPPLY VOLTAGE**

T_A = +25°C C_L = 15pF

DS1088C toc03
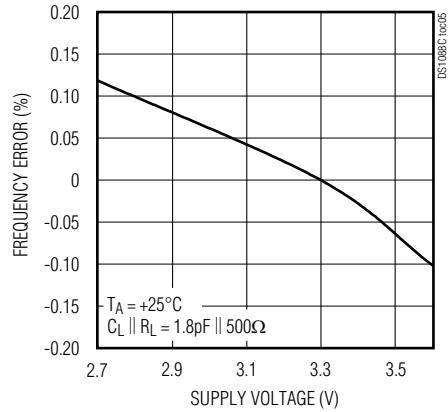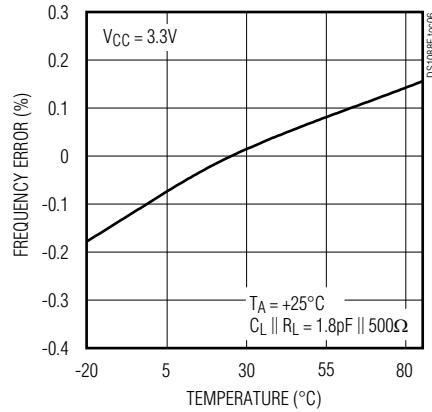
**SHUTDOWN SUPPLY CURRENT
vs. TEMPERATURE**

V_{CC} = 3.3V $V_{\overline{PDN}}$ = 0V

DS1088C toc04
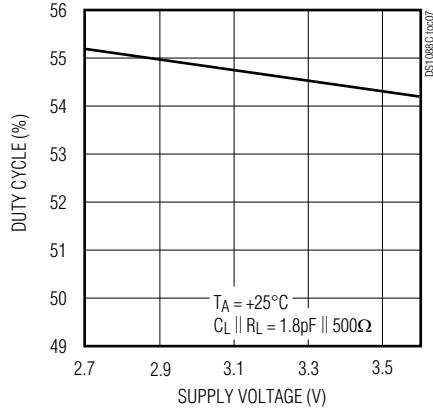
**FREQUENCY ERROR
vs. SUPPLY VOLTAGE**

T_A = +25°C
C_L || R_L = 1.8pF || 500Ω

DS1088C toc05
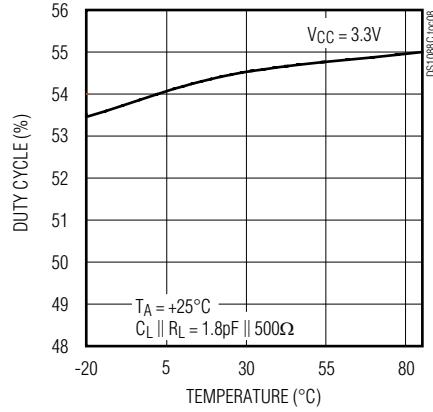
**FREQUENCY ERROR
vs. TEMPERATURE**

V_{CC} = 3.3V

T_A = +25°C
C_L || R_L = 1.8pF || 500Ω

DS1088E toc06

**DUTY CYCLE
vs. SUPPLY VOLTAGE**

T_A = +25°C
C_L || R_L = 1.8pF || 500Ω

DS1088C toc07
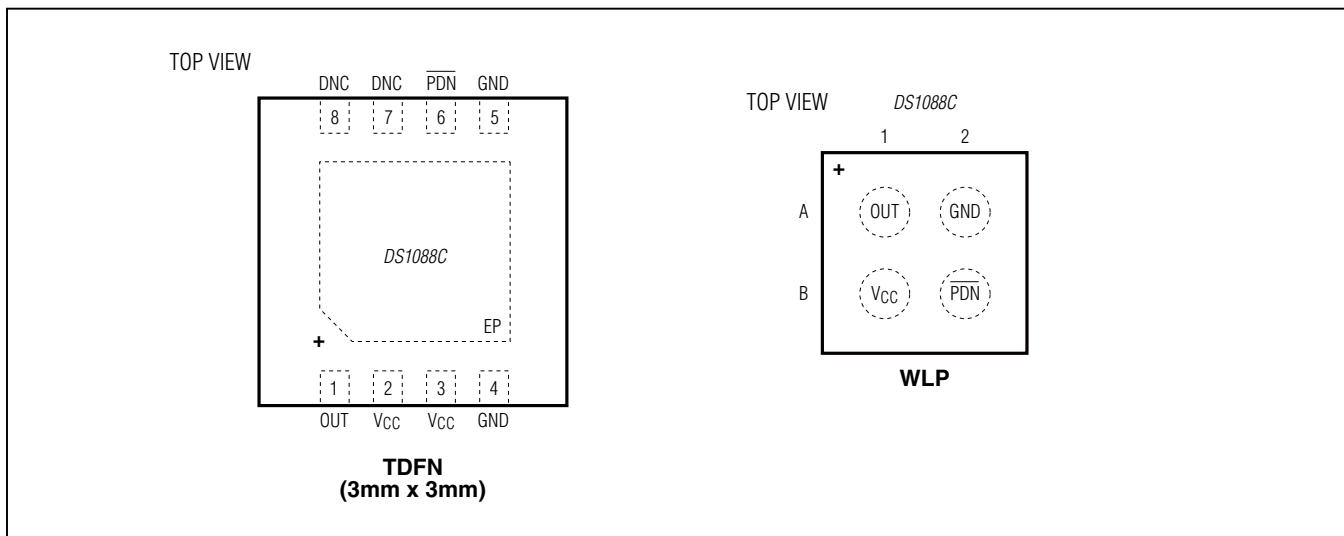
**DUTY CYCLE
vs. TEMPERATURE**

V_{CC} = 3.3V

T_A = +25°C
C_L || R_L = 1.8pF || 500Ω

DS1088C toc08

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引脚/焊球配置

引脚/焊球说明

引脚/焊球		名称	功能
TDFN-EP	**WLP**		
1	A1	OUT	振荡器输出。
2, 3	B1	V_{CC}	电源。
4, 5	A2	GND	地。
6	B2	$\overline{PDN}$	低电平有效关断。引脚为高电平时，使能振荡器。引脚为低电平时，禁止振荡器(关断模式)。
7, 8	—	DNC	不连接。DNC引脚内部连接至地。
—	—	EP	裸焊盘(TDFN封装)。内部连接至GND，连接至接地区域，将注入噪声降至最小。不作为器件的电气连接。

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详细说明

DS1088C低成本时钟发生器无需外部定时元件，即可输出方波。固定频率振荡器经过了工厂校准，工作在133MHz频率。DS1088C具有关断引脚，适用于功耗敏感应用，图1所示为DS1088C方框图。

输出频率

内部振荡器频率由工厂编程的预分频器进行分频，产生133MHz输出频率。

关断模式

$\overline{PDN}$引脚禁用内部振荡器和振荡器输出，以满足功率敏感应用的要求。关断引脚必须在至少两个输出频率周期+10µs的时间内保持低电平，以消除尖峰脉冲的影响。上电时，禁用输出，直到电源稳定，并且压控振荡器产生512个时钟周期。
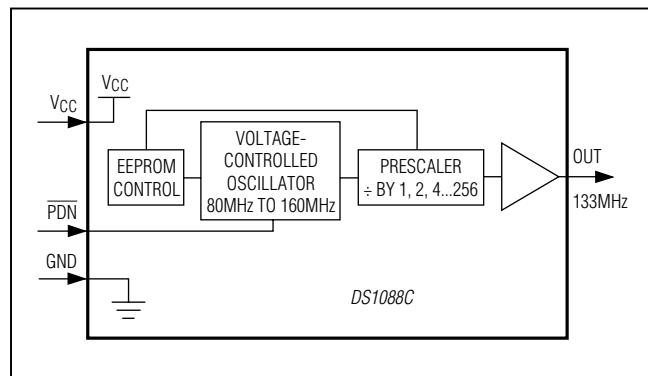

图1. 方框图

应用信息

电源去耦

使用DS1088C时，为达到最佳结果，必须用0.01µF和0.1µF高质量、陶瓷、表贴电容对电源进行去耦。表贴元件将引线电阻降至最小，从而改善性能，并且为去耦应用提供足够的高频响应。这些电容应尽量靠近V_{CC}和GND引脚安装。

芯片信息

SUBSTRATE CONNECTED TO GROUND

DS1088C

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定购信息

PART	FREQUENCY (MHz)	TEMP RANGE	PIN-PACKAGE
DS1088CN-133+T	133.3	-20°C to +85°C	8 TDFN-EP*
DS1088CX-133+T	133.3	-20°C to +85°C	4 WLP

+表示无铅(Pb)/符合RoHS标准的封装。
T = 卷带包装。
*EP = 裸焊盘。

封装信息

如需最近的封装外形信息和焊盘布局(占位面积)，请查询**china.maximintegrated.com/packages**。请注意，封装编码中的"+"、"#"或"−"仅表示RoHS状态。封装图中可能包含不同的尾缀字符，但封装图只与封装有关，与RoHS状态无关。

封装类型	封装编码	外形编号	焊盘布局编号
8 TDFN-EP	T833+2	**21-0137**	**90-0059**
4 WLP	W41D1+1	**21-0455**	参见**应用笔记1891**

修订历史

修订号	修订日期	说明	修改页
0	3/12	最初版本。	—

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