DL0808

Analog Watch Circuit

GENERAL DESCRIPTION

The DL0808 (series) is an analog wristwatch circu it in CMOS silicon gate process. The circuit is designed for a 32,768Hz crystal oscillator analog watch that drives stepper motor. The output frequency can be set to 1Hz or 16Hz by mask option. The pulse width can be selected from 3.9ms to 6.8ms in 0.98ms increment by mask option. It includes an on-chip voltage regulator for low power consumption and high stability.

FEATURES

- 32,768Hz crystal oscillator
- Single 1.5V battery operation
- Low power dissipation
- Reset function
- Output pulse width can be set from 3.9ms to 6.8ms in 0.98ms increments by mask option
- Output pulse frequency can be set to 1Hz or 16Hz by mask option

FUNCTION DESCRIPTION

1. VOLTAGE REGULATOR

    Negative supply voltage VF controlled by the voltage regulator is supplied to the oscillator and the leading counter controlled by high frequency. This improves the stability of the oscillator and decreases the total power consumption.
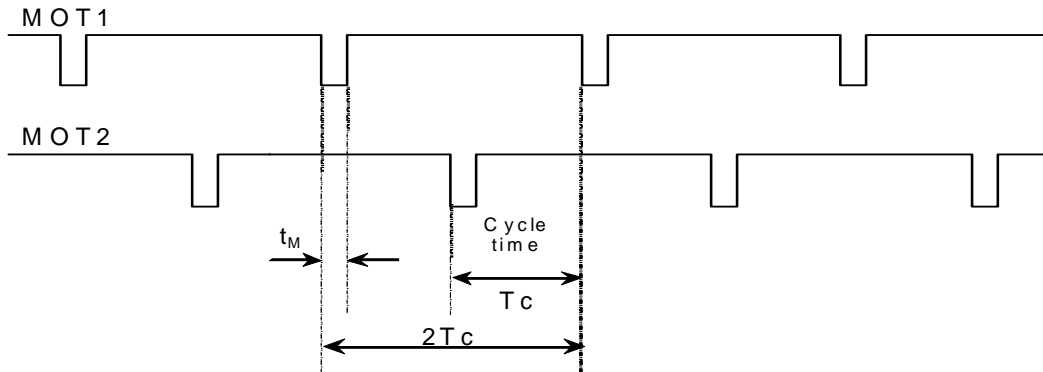
2. MOTOR DRIVE OUTPUT

    The HKA1508 contains two push-pull output buffers for driving bipolar stepping motor. The output cycle time and pulse width can be selected by mask option.

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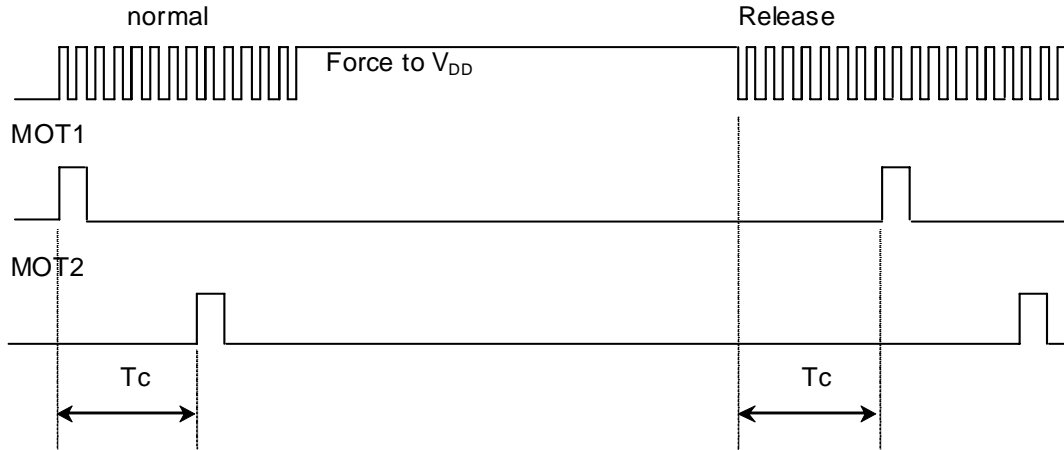
Analog Watch Circuit

RESET open

3. RESET

A square wave of 512Hz can be measured on RESET pad in normal operation. When RESET pin is connected to VDD, output pulses will be reset after a debounce time. The minimum debounce time is 4ms. When RESET is released from VDD, the next motor pulse will appear after one cycle time.
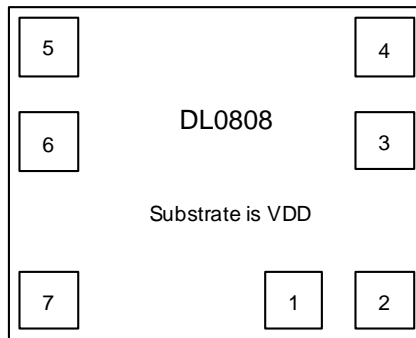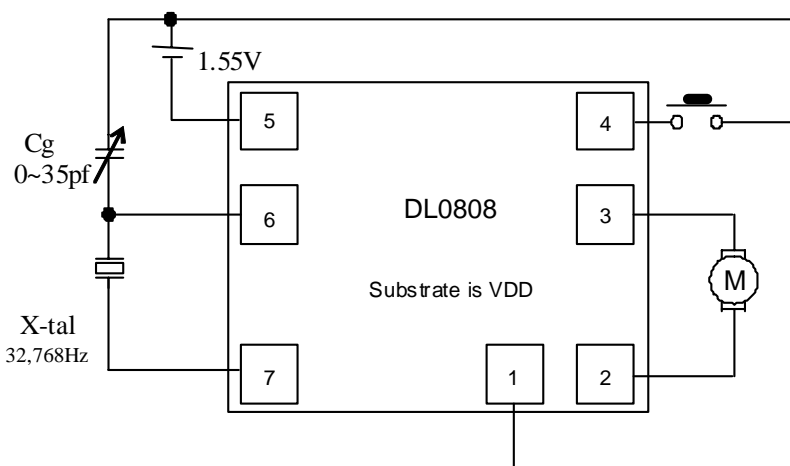
RESET

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BONDING DIAGRAM

PAD No.	PAD Name	X(μm)	Y(μm)	PADNo.	PAD Name	X(μm)	Y(μm)
1	V_{DD}	390	60	5	V_{SS}	60	410
2	MOT1	510	60	6	OSCI	60	300
3	MOT2	510	246	7	OSCO	60	57.4
4	RESET	510	410	--	------	-----	----

TYPICAL APPLICATION CIRCUIT

ELECTRICAL CHARACTERISTICS

(V_{DD}= 1.55V, V_{SS}=0V, T_a= +25°C; unless otherwise specified)

Analog Watch Circuit

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Operating Voltage	V_{DD}		1.2	1.55	1.8	V
Supply Current	I_{DD}	HKA1508-15 No Load		230	350	nA
Voltage Between Motor Output	V_M	$RL=2K\Omega$	±1.4	±1.5		V
Output Cycle time	T_C	Mask Option	1/16		1	s
Pulse Width	t_M	Mask Option	3.9		6.8	ms
REEST Output Frequency	F_{RE}	RESET as output		512		Hz
RESET Debounce Time	T_{RE}	RESET=V_{DD}	2		4	ms
Input Current After Debounce Time	I_R	RESET =V_{DD}	3	18	50	nA
Oscillator Start Up Voltage	V_{ST}		1.2			V
Oscillator Start Up Time	T_{ST}				2	sec
Oscillator Stability	$\Delta f/f$	$\Delta V_{SS}=100mV$		0.2	1	ppm
Oscillator Internal Capacitance	Cint	Mask Option	3		40	pF

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AVAILIABLE TYPES

Types 型号	Tc(s)	t_M (ms)	Internal caps (pf)		X-tal C_L (pf)	Suggested external cap	Typical Idd (μA)	Frequency Accuracy 中心频点 （ppm）
			Cin	Cout		Cg (pf)		
1508-28	1	5.9	14	11	8	0	0.23	0