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DL8239

Analog Alarm Clock With Snooze

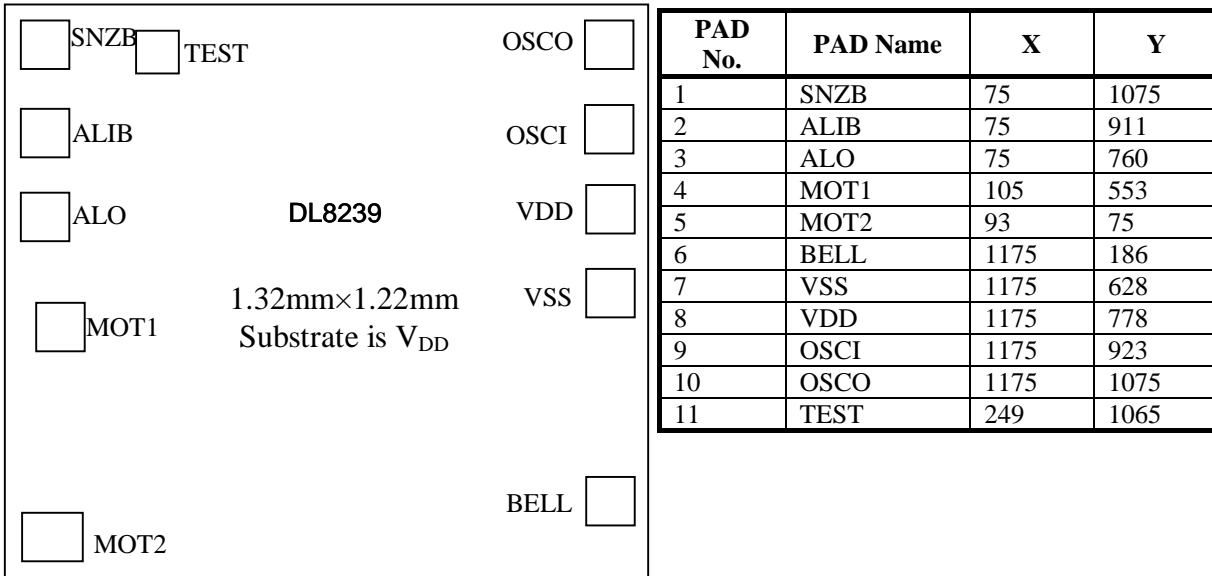
General Description

The DL8239 series are analog clock ICs that derive their timing from a 32768Hz oscillator element. They feature alarm output snooze function and alarm auto-stop function. They can be configured to match a wide variety of clock specifications, alarm functions and motor outputs.

Features

- Single 1.5V battery operation
- 32768 Hz crystal frequency
- Low power dissipation
- Built-in trim capacitor
- 25pf(max.) built-in capacitors between VDD and OSC1
- 25pf(max.) built-in capacitors between VDD and OSC0
- Output for 1Hz or 16Hz stepper motor with selectable pulse width
- 256 second snooze interval
- 128 second alarm output auto-stop function (Mask Option)
- Alarm outputs compatible with both electronic sound alarms and motor bells
- 4-step increasing volume alarm output
- 3-step increasing volume bell output
- 3-step alarm change to bell function
- ALIB and SNZB use different pins
- Built-in debounce circuit (ALIB/SNZB pin)
- Fast test functions
- Power-on-clear function

Pad Layout





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Type List

TYPE	ALO	BELL	MOT frequency	MOT pulse width
DL8239-AH	SINGLE	SINGLE	1Hz	15.625ms
DL8239-AF	SINGLE	SINGLE	1Hz	23.4375ms
DL8239-AG	SINGLE	SINGLE	1Hz	31.25ms
DL8239-AA	SINGLE	SINGLE	1Hz	46.875ms
DL8239-AK	SINGLE	SINGLE	16Hz	31.25ms
DL8239-AJ	SINGLE	SINGLE	16Hz	62.5ms
DL8239-BH	4 step	3 step	1Hz	15.625ms
DL8239-BF	4 step	3 step	1Hz	23.4375ms
DL8239-BG	4 step	3 step	1Hz	31.25ms
DL8239-BB	4 step	3 step	1Hz	46.875ms
DL8239-BK	4 step	3 step	16Hz	31.25ms
DL8239-BJ	4 step	3 step	16Hz	62.5ms
DL8239-CH	3 step==>>	SINGLE	1Hz	15.625ms
DL8239-CF	3 step==>>	SINGLE	1Hz	23.4375ms
DL8239-CG	3 step==>>	SINGLE	1Hz	31.25ms
DL8239-CC	3 step==>>	SINGLE	1Hz	46.875ms
DL8239-C K	3 step==>>	SINGLE	16Hz	31.25ms
DL8239-CJ	3 step==>>	SINGLE	16Hz	62.5ms

3-step BELL Waveform

Time (sec) After Turning Alarm on	BELL Waveform
1~8	
9~16	
17~	

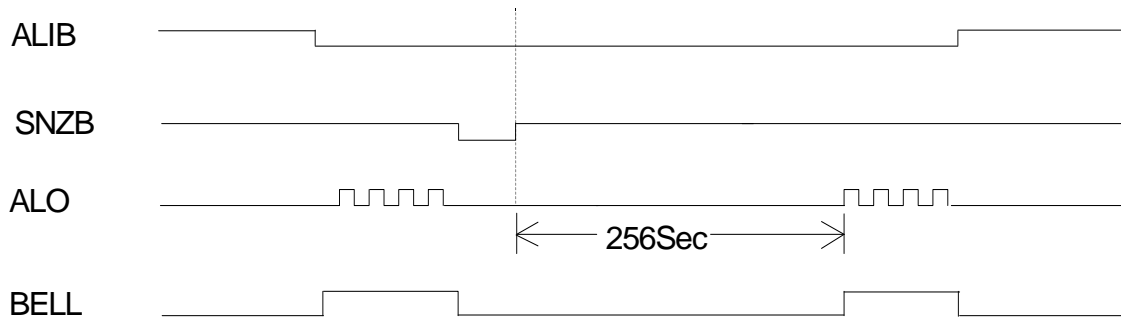


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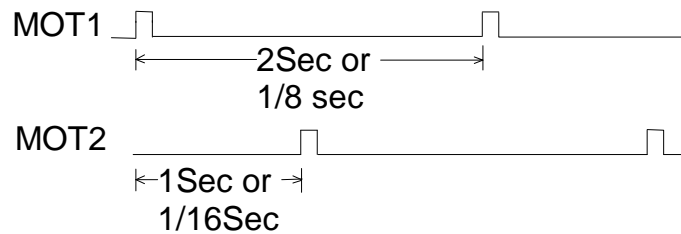
4-step Alarm Waveform

Time (sec) After Turning Alarm on	Alarm Waveform	Duty (%) of Fundamental Wave
1~8	<p>500mS 500mS 2048 × 4 × 1Hz</p>	12.5%
9~16	<p>500mS 500mS 2048 × 8 × 1Hz</p>	25%
17~24	<p>500mS 500mS 2048 × 8 × 1Hz</p>	50%
25~	<p>500mS 500mS 2048 × 8Hz</p>	50%

Snooze Waveform



Motor Output Driving

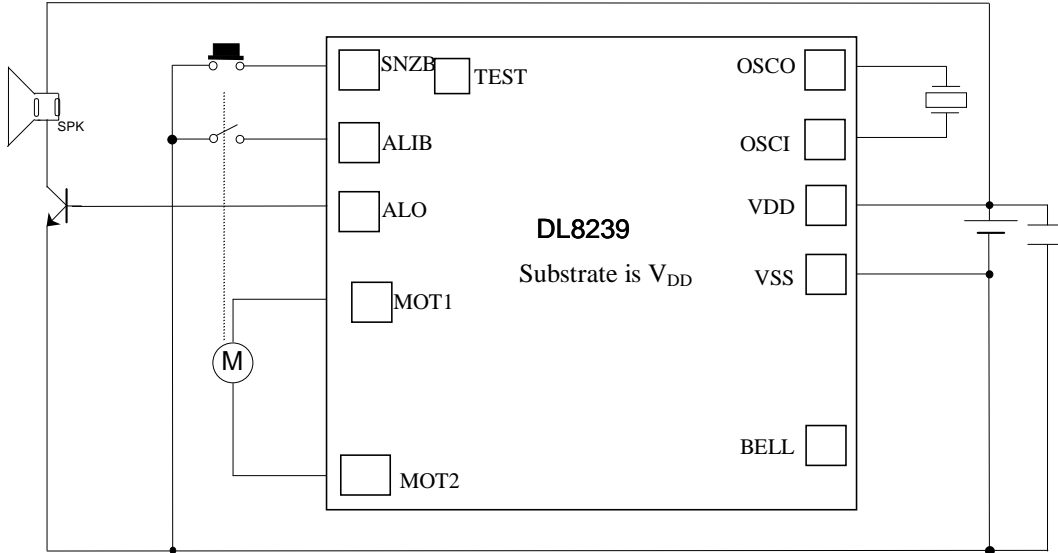




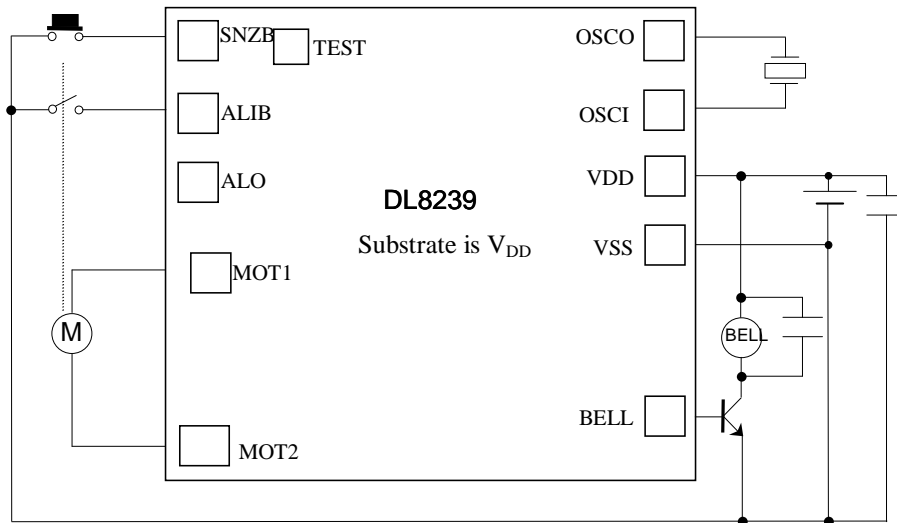
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Application Diagram

Speaker application



Bell application





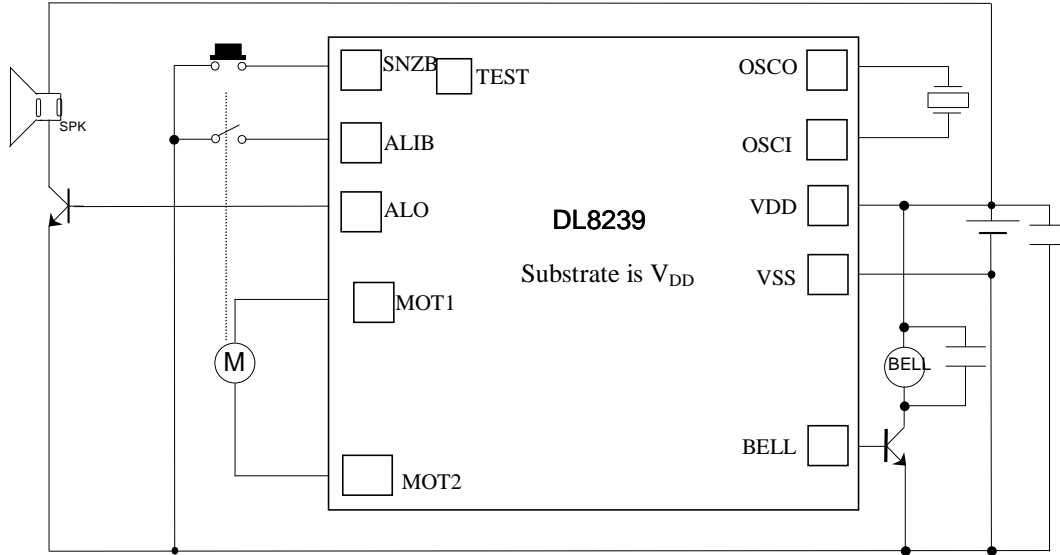
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Analog Alarm Clock With Snooze

Speaker change to Bell



DC Characteristics

($V_{DD}=1.5V$, $V_{SS}=0V$, $F_{osc}=32768Hz$, $T_a=25^\circ C$, unless specified otherwise)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply Voltage	V_{DD}		1.1		1.8	V
Operating Current	I_{DD}	No Load		1.2	2.0	μA
Output Current Motor	I_M	$V_{DD}=1.2V$ $R_L=200\Omega$	4.5			mA
Alarm high	I_{OHA}	$V_{OHA}=0.7V$	0.1	0.25	0.35	mA
Alarm low	I_{OLA}	$V_{OLA}=0.5V$	0.1	0.25	0.35	mA
Output Current Bell High	I_{OHB}	$V_{DD}=1.3V$ $V_{OHA}=0.5V$	1	1.5		mA
OSC. Start time		$V_{DD}=1.2V$			2	sec
OSC. Stability	$\Delta f/f$	$\Delta V_{DD}=0.1V$		0.5	1	ppm
Internal Cap. between V_{DD} and OSCO	C_d	Mask Option	5		25	pF
Internal Cap. between V_{DD} and OSCI	C_g	Mask Option	5		25	pF
Freq. on TEST pin	f_{TEST}	TEST as output	512 (50% duty)			Hz

Absolute Maximum Ratings

Parameter	Symbol	Condition	Limits	Unit
Supply Voltage	V_{DD}	$V_{SS}=0V$, $T_a = 25^\circ C$	-0.3 ~ 5.0	V
Input Voltage	V_{IN}	$T_a = 25^\circ C$	$V_{SS}-0.3 \sim V_{DD}+0.3$	V
Operation Temperature	T_{OPR}		0 ~ 70	$^\circ C$
Storage Temperature	T_{STG}		-55 ~ 125	$^\circ C$