DALLAS
**SEMICONDUCTOR**

DS1285, DS1285Q
Real Time Clock

FEATURES

- Drop-in replacement for IBM AT computer clock/calendar

- Pin configuration closely matches MC146818A

- Counts seconds, minutes, hours, days, day of the week, date, month, and year with leap year compensation

- Binary or BCD representation of time, calendar, and alarm

- 12- or 24-hour clock with AM and PM in 12-hour mode

- Daylight Savings Time option

- Selectable between Motorola and Intel bus timing

- Multiplex bus for pin efficiency

- Interfaced with software as 64 RAM locations
  - 14 bytes of clock and control registers
  - 50 bytes of general purpose RAM

- Programmable square wave output signal

- Bus compatible interrupt signals ($\overline{\text{IRQ}}$)

- Three interrupts are separately software-maskable and testable
  - Time-of-day alarm once/second to once/day
  - Periodic rates from 122 μA to 500 ms
  - End of clock update cycle

- Optional 28-pin PLCC surface mount package

DESCRIPTION

The DS1285 Real Time Chip is a direct replacement for the MC146818A in IBM AT computer clock/calendar and other applications. An external crystal and battery are the only components required to maintain time-of-day and memory status in the absence of power. For a complete description of operating conditions, electrical characteristics, bus timing, and pin descriptions other than X1, X2, V_{BAT}, and $\overline{\text{RCLR}}$, see the DS1287 data sheet.

PIN ASSIGNMENT
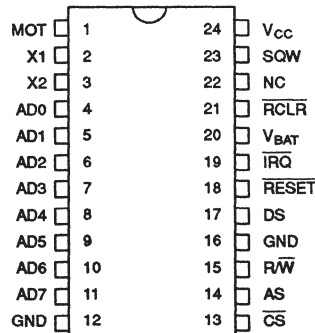
DS1285 24–PIN DIP
DS1285S 24–PIN SOIC
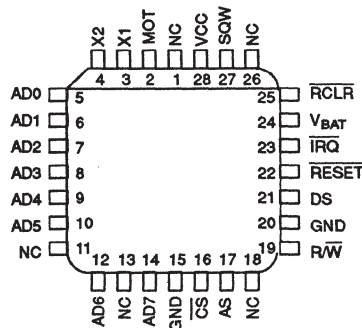
DS1285Q 28-PIN PLCC

PIN DESCRIPTION

|		
AD0-AD7	-	Multiplexed Address/Data Bus
NC	-	No Connection
MOT	-	Bus Type Selection
$\overline{\text{CS}}$	-	Chip Select
AS	-	Address Strobe
R/$\overline{\text{W}}$	-	Read/Write Input
DS	-	Data Strobe
$\overline{\text{RESET}}$	-	Reset Input
$\overline{\text{IRQ}}$	-	Interrupt Request Output
SQW	-	Square Wave Output
V_{CC}	-	+5 Volt Supply
GND	-	Ground
X1,X2	-	32.768 kHz Crystal Connections
V_{BAT}	-	+3 Volt Battery Input
$\overline{\text{RCLR}}$	-	RAM Clear

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PIN DESCRIPTION

X1, X2 - Connections for a standard 32.768 kHz quartz crystal, Daiwa part number DT-26S, Seiko part number DS-VT-200, or equivalent. The internal oscillator circuitry is designed for operation with a crystal having a specified load capacitance (CL) of 6 pF. A variable trimming capacitor may be required for extremely high precision timekeeping applications. Crystals can be ordered from Dallas Semiconductor. Order part number DS9032.

V_{BAT} - Battery input for any standard 3 volt lithium cell or other energy source. Battery voltage must be held between 2.5 and 3.7 volts for proper operation. The nominal write protect trip point voltage at which access to the real time clock and user RAM is denied is set by the internal circuitry as 1.26 x V_{BAT}. A maximum load of .5 µA at 25°C in the absence of power should be used to size the external energy source.
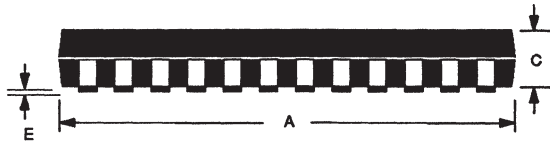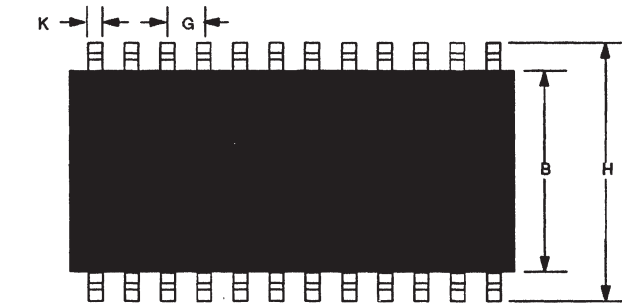
$\overline{RCLR}$ - The $\overline{RCLR}$ pin is used to clear (set to logic 1) all 50 bytes of general purpose RAM but does not affect the RAM associated with the real time clock. In order to clear the RAM, $\overline{RCLR}$ must be forced to an input logic 0 (-0.3 to +0.8 volts) during battery back-up mode when V_{CC} is not applied. The $\overline{RCLR}$ function is designed to be used via human interface (shorting to ground manually or by switch) and not to be driven with external buffers. This pin is internally pulled up.

DS1285 24 PIN DIP
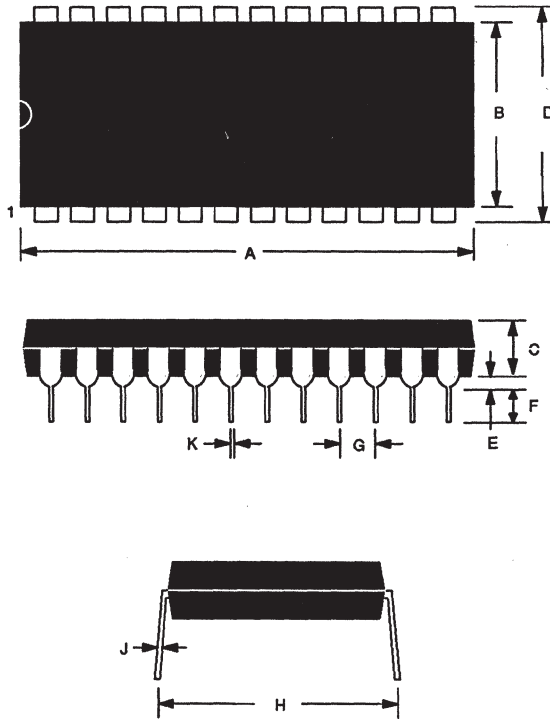
PKG	24-PIN	
DIM	MIN	MAX
A IN.	1.245	1.270
MM	31.62	32.25
B IN.	0.530	0.550
MM	13.46	13.97
C IN.	0.145	0.165
MM	3.68	4.19
D IN.	0.600	0.625
MM	15.24	15.88
E IN.	0.015	0.050
MM	0.380	1.27
F IN.	0.120	0.145
MM	3.05	3.68
G IN.	0.090	0.110
MM	2.29	2.79
H IN.	0.625	0.675
MM	15.88	17.15
J IN.	0.008	0.012
MM	0.20	0.30
K IN.	0.015	0.022
MM	0.38	0.559

DS1285 24 PIN SOIC

PKG	24-PIN	
DIM	MIN	MAX
A IN. MM	0.602 15.29	0.612 15.54
B IN. MM	0.290 7.37	0.300 7.65
C IN. MM	0.089 2.26	0.095 2.41
E IN. MM	0.004 0.102	0.012 0.30
F IN. MM	0.094 2.38	0.105 2.68
G IN. MM	0.050 BSC 1.27 BSC	
H IN. MM	0.398 10.11	0.416 10.57
J IN. MM	0.009 0.229	0.013 0.33
K IN. MM	0.013 0.33	0.019 0.48
L IN. MM	0.016 0.406	0.040 1.02
phi	0°	8°

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DS1285Q 28 PIN PLCC
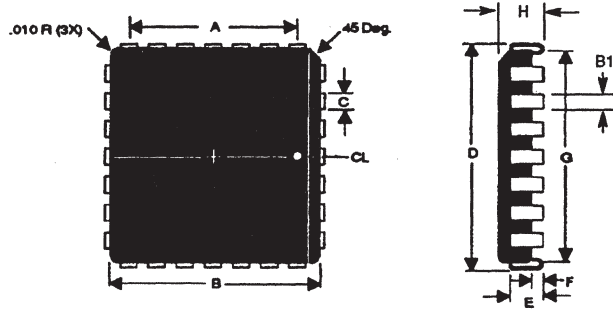
PKG	28-PIN	
DIM	MIN	MAX
A IN. MM	0.300 REF 7.62	
B IN. MM	0.442 17.68	0.462 11.73
B1 IN. MM	0.013 0.33	0.021 0.53
C IN. MM	0.027 0.68	0.033 0.84
D IN. MM	0.480 12.2	0.500 12.7
E IN. MM	0.090 2.29	0.120 3.05
F IN. MM	0.020 0.51	MIN MIN
G IN. MM	0.390 9.91	0.430 10.92
H IN. MM	0.165 4.19	0.180 4.57