RCL Semiconductors Ltd.

Six Functions Six Digit Alarm Watch C1927

With EL Back Light Control

GENERAL DESCRIPTION

C1927 is a CMOS digital 6-function watch integrated circuit with alarm, autoranging chronograph function and EL Back light control; designed to for a 6-digit duplexed liquid crystal display, 7-day mark, date mark, AM/PM mark and colon.

FUNCTIONS

- 6 Functions: Month, Date, Day-of-Week, Hour, Minute, Second.
- EL Back light control with 3 second delay.
- 6-digit Chronograph: Autoranging after 30 minutes to hour, minute; second.
- User selectable 12-hour/24-hour format.
- Alarm output for melody IC.
- 4-year calendar.
- One-touch correction of time error within +/-30 seconds.
- Fast advance for time and alarm time set.
- Chime on every hour.
- 3-switch sequential operation.
- LCD test.

FEATURES

- Single battery operation (2.6-3.6V).
- 32,768Hz crystal frequency.
- Single-chip CMOS construction and low power dissipation.
- On chip voltage doubler transducer.
- Drives 6-digit duplexed LCD with 7-day mark, AM/PM mark, date mark and alarm mark.
- Built-in EL Back light control circuit.
- Colon display.
- Direct drive of piezoelectric transducer at 3-volt peak to peak.
- Debounce circuitry on switch inputs.
- ESD protection.

ABSOLUTE MAXIMUM RATINGS

(T_2 = 25 °C)

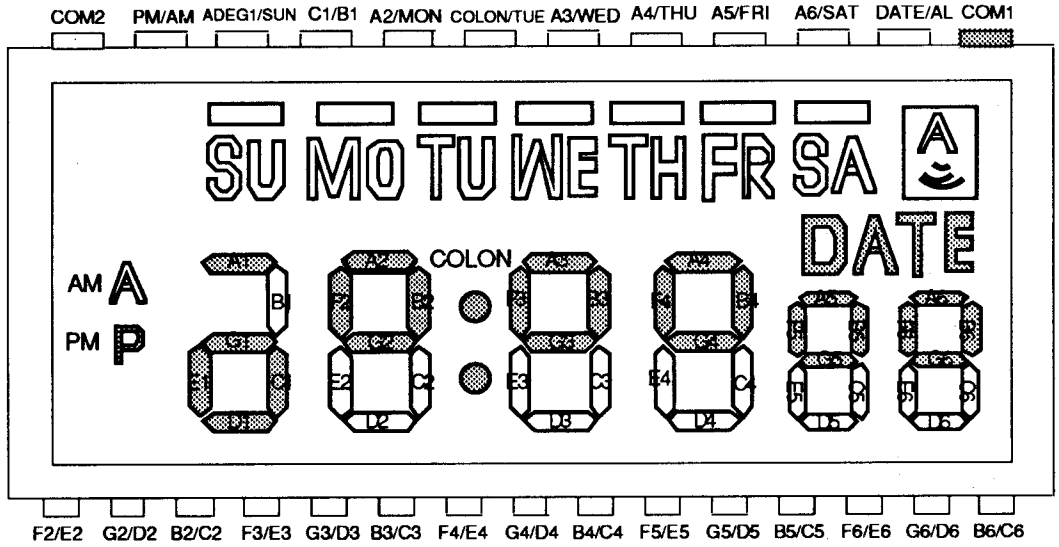
Parameter	Symbol	Limits
Supply Voltage (V_{DD1} - V_{SS})	V_{DS1}	- 0.3V to +2.0V
Supply Voltage (V_{DD2} - V_{SS})	V_{DS2}	- 0.3 V to +4.0V

DC ELECTRICAL CHARACTERISTICS

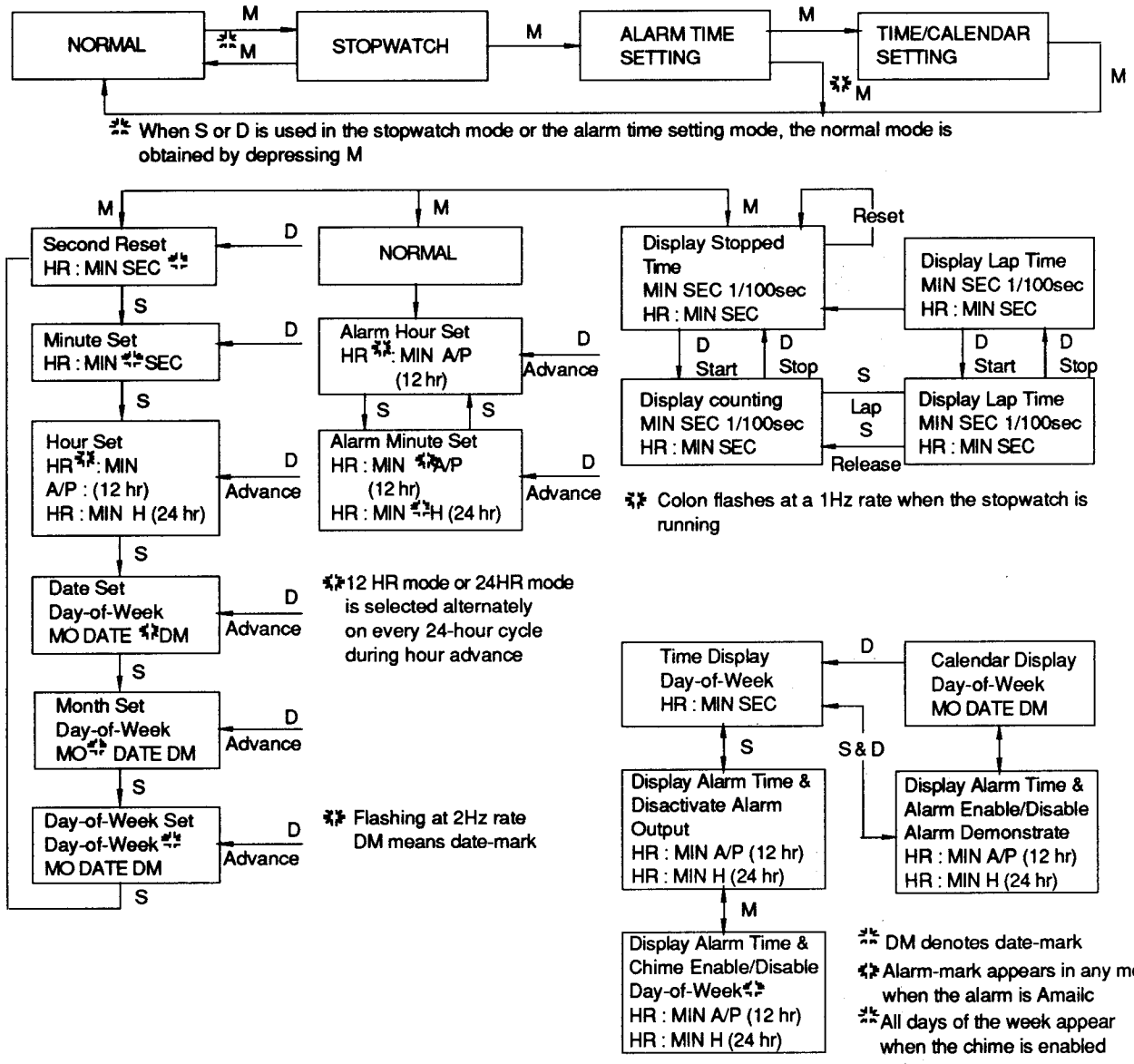
(T_2 = 25°C, V_{SS} = 0V, V_{DD} = 3.0V unless otherwise specified.)

Characteristics	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Operating Voltage	VDD1	1.3	1.5	1.8	V	-
	VDD2	2.6	3.0	3.6	V	-
Supply Current	IDD	-	1.0	3.5	µA	Without load
Oscillator Frequency	FOSC	-	32,768	-	Hz	-
LCD Frequency	FD	-	32	-	Hz	-
IND Output Source Current	IOH1	0.6	1.0	-	mA	VOH = 0.8V
EL Output Source Current	IOH2	0.4	0.8	-	mA	VOH = 0.8V
EL Ouput Sink Current	IOL2	0.5	0.8	-	mA	VOL = 0.8V
IND Ouput Sink Current	IOL1	4.0	15	-	mA	VOL = 0.8V

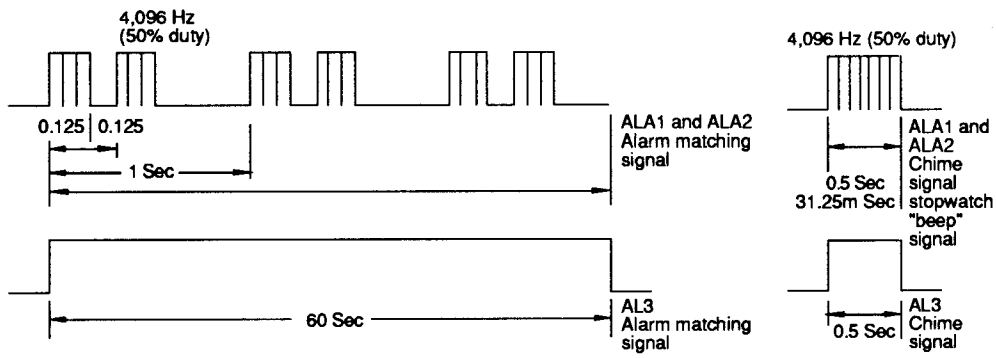
LCD FORMAT



SETTING SEQUENCE AND SWITCH OPERATION

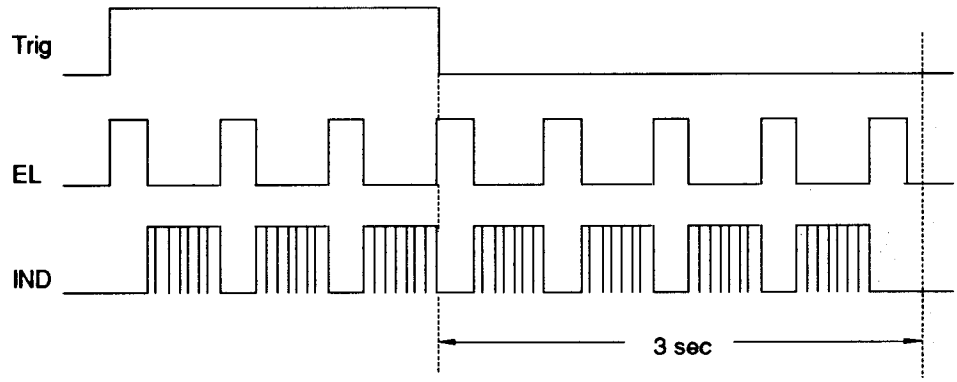


a) ALARM OUTPUT WAVEFORM



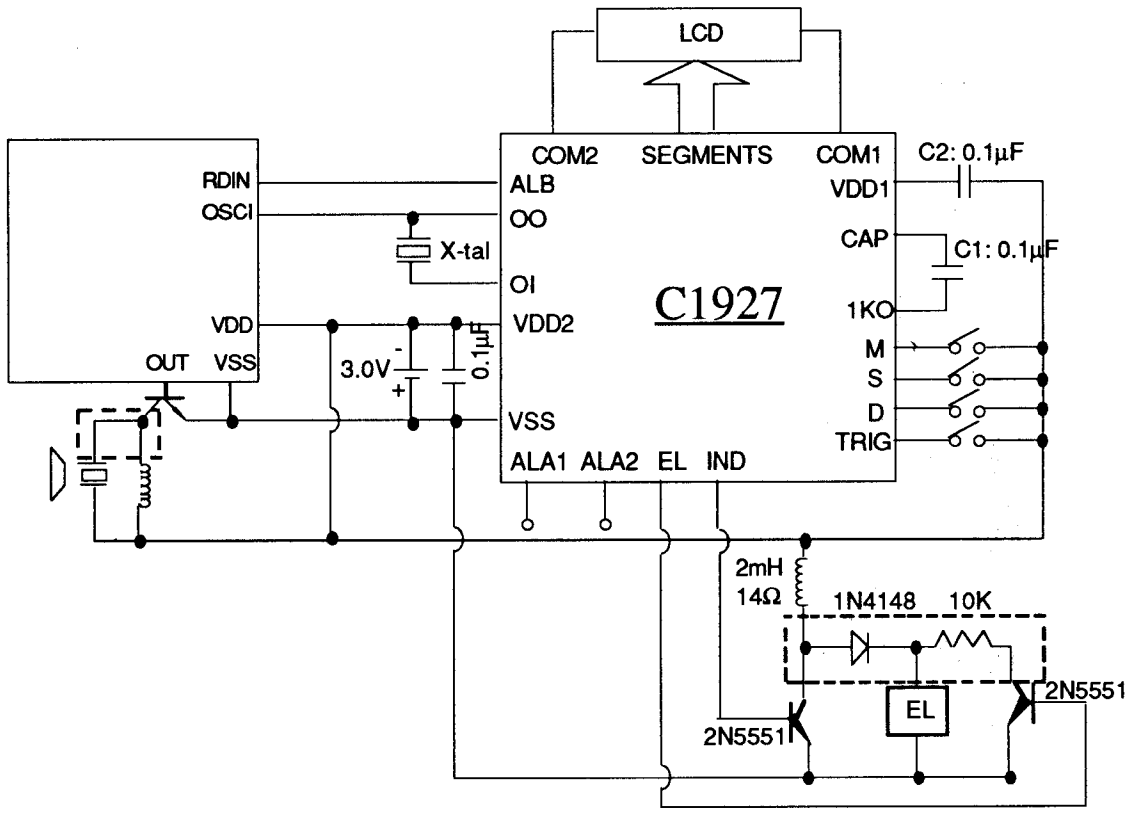
b) EL ELECTROLUMINESCENCE LAMP DRIVER OUTPUT WAVEFORM

Trigger with 3 Sec Delay :



APPLICATION CIRCUIT

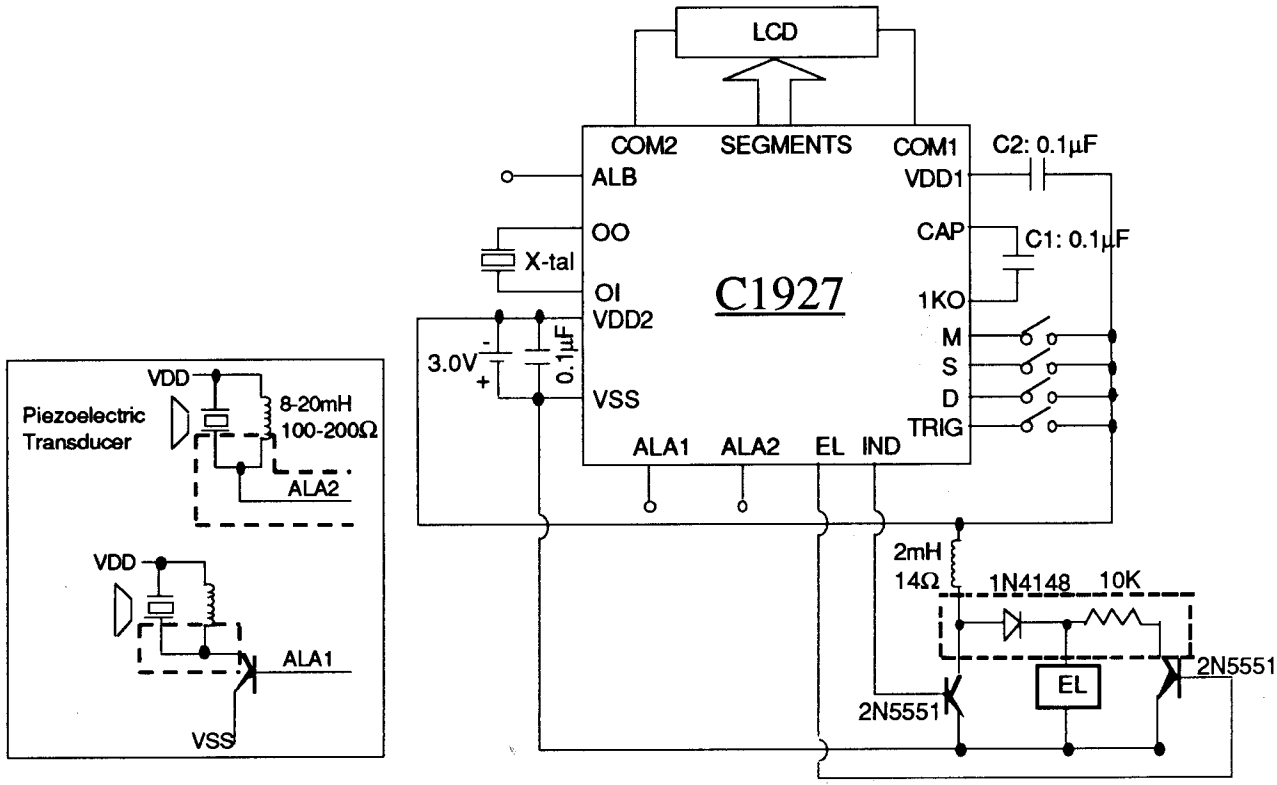
a) MELODY DRIVE TYPE



NOTE:

Substrate is connector to VSS.

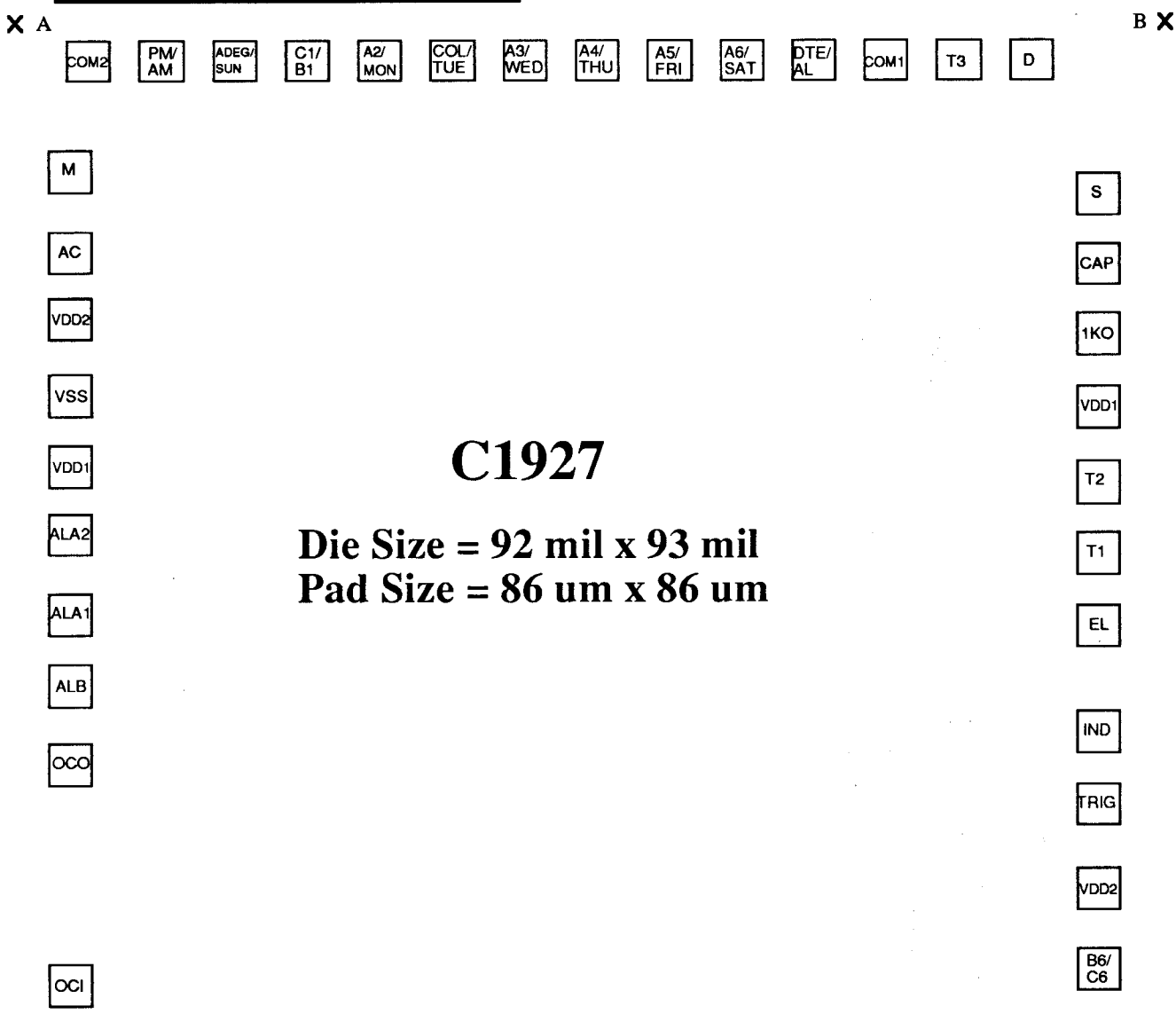
b) PIEZO DRIVE TYPE



NOTE:

Substrate is connector to VSS.

C1927 / PAD DIAGRAM



The Co-ordinates for Lower Left Corner of Each Pad

F2/E2(-989.0, -1095.3)
G2/D2(-843.1, -1095.3)
B2/C2(-697.3, -1095.3)
F3/E3 (-551.4, -1095.3)
G3/D3(-405.4, -1095.3)
B3/C3(-259.5, -1095.3)
F4/E4(-113.5, -1095.3)
G4/D4(32.4, -1095.3)
B4/C4(178.4, -1095.3)
F5/E5(324.3, -1095.3)
G5/D5(470.1, -1095.3)
B5/C5(616.0, -1095.3)
F6/E6(762.0, -1095.3)
G6/D6(907.9, -1095.3)

B6/C6(991.6, -860.6)
VDD2(991.6, -691.7)
TRIG (991.6, -521.4)
IND (991.6, -371.1)
EL (991.6, -155.7)
T1 (991.6, -6.0)
T2 (991.6, 143.0)
VDD1(991.6, 300.4)
1KO (991.6, 446.7)
CAP (991.6, 589.8)
S (991.6, 735.5)

D (857.3, 1009.1)
T3 (711.4, 1009.1)
COM1 (565.4, 1009.1)
DTE/AL (419.5, 1009.1)
A6/SAT (273.7, 1009.1)
A5/FRI (127.8, 1009.1)
A4/THU (-18.2, 1009.1)
A3/WED (-164.1, 1009.1)
COL/TUE (-310.1, 1009.1)
A2/MON (-456.0, 1009.1)
C1/B1 (-602.0, 1009.1)
ADEG/SUN(-747.9, 1009.1)
PM/AM (-893.7, 1009.1)
COM2 (-1039.6, 1009.1)

M (-1077.8, 784.0)
AC (-1077.8, 616.7)
VDD2(-1077.7, 475.3)
VSS (-1077.7, 323.3)
VDD1(-1077.7, 176.4)
ALA2(-1077.7, 34.2)
ALA1(-1077.7, -131.3)
ALB (-1077.7, -277.3)
OCO (-1077.7, -435.5)
OCI (-1077.8, -892.3)

The Co-ordinates of Sensor

A (-1211.4, 1138.1) B (1125.4, 1138.1)