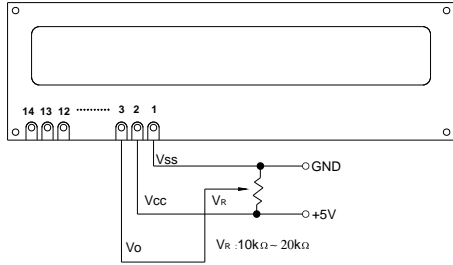
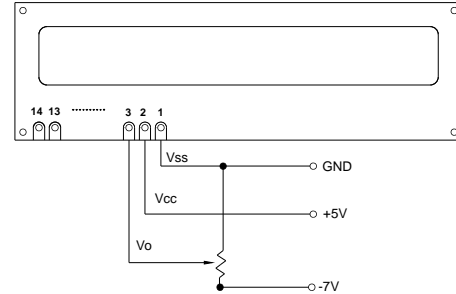


● **EXAMPLE OF POWER SUPPLY**

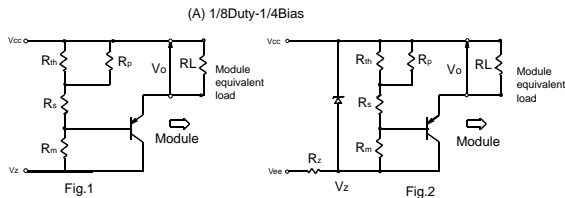
◆ **Normal Temperature Type**



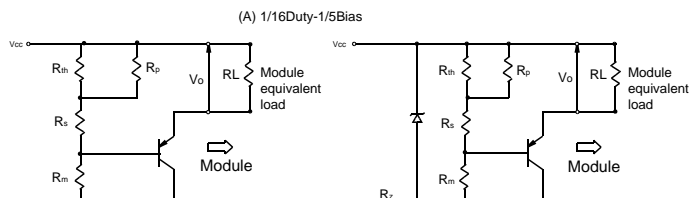
◆ **Extended Temperature Type**



◆ **Examples of Temperature Compensation Circuits for Extended Temp. (Only for reference)**



Thermistor: Rth[25°C]= 15[k-ohm], B=4200(K)
Resistors: Rp=30[k-ohm], Rs=6.8[k-ohm], Rm=3.3[k-ohm]
Transistor: PNP Type
Vcc: +5V, Vss: 0V [Logic Supply]
Vz: -8[V] (-7.8 to -8.2[V])
Vee<Vz[V], Rz=[Vz-Vee] / 5[k-ohm]



Thermistor: Rth[25°C]= 15[k-ohm], B=4200(K)
Resistors: Rp=510[k-ohm], Rs=8.2[k-ohm], Rm=3.9[k-ohm]
Transistor: PNP Type
Vcc: +5V, Vss: 0V [Logic Supply]
Vz: -11[V] (-10.725 to -11.275[V])
Vee<Vz[V], Rz=[Vz-Vee] / 5[k-ohm]

● **INSTRUCTIONS**

Instruction	Code										Description	Executed Time(max.)
	RS	R/W	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0		
Clear Display	0	0	0	0	0	0	0	0	0	1	Clears all display and returns the cursor to the home position (Address 0).	1.64mS
Cursor Art Home	0	0	0	0	0	0	0	0	0	*	Returns the cursor to the home positio (Address 0). Also returns the display bing shifted to the original position. DD RAM contents remain unchanged.	1.64mS
Entry Mode Set	0	0	0	0	0	0	0	1	I/D	S	Sets the cursor move direction and specifes or not to shift the display. These operations are performed during data write and read.	40 μS
Display On/Off Control	0	0	0	0	0	0	1	D	C	B	Sets ON/OFF of all display (D), cursor NO/OFF (C), and blink of cursor position character (B).	40 μS
Cursor /Display Shift	0	0	0	0	0	1	S/C	R/L	*	*	Moves the cursor and shifts the display without changing DD RAM contents.	40 μS
Function Set	0	0	0	0	1	DL	N	F	*	*	Sets interface data length (DL) number of display lines (L) and character font (F)	40 μS
CG RAM Address Set	0	0	0	1	ACG						Sets the CG RAM address. CG RAM data is sent and received after this setting.	40 μS
DD RAM Address Set	0	0	1	ADD						Sets the DD RAM address. DD RAM data is sent and received after this setting.	40 μS	
Busy Flag/ Address Read	0	1	BF	AC						Reads Busy flag (FB) indicating internal operation is being performed and reads address counter counts.	0 μS	
CG RAM / DD RAM Data Write	1	0	WRITE DATA								Writes data into DD RAM or CG RAM.	40 μS
CG RAM / DD RAM Data Read	1	1	READ DATA								Reads data from DD RAM or CG RAM.	40 μS

Code	Description	Executed Time (max)
I / D = 1 : Increment I / D = 0 : Decrement S = 1 : With display shift S / C = 0 : cursor movement R / L = 1 : Shift to the right R / L = 0 : Shift to the left D L = 1 : 8-bit	D / L = 0 : 4-bit N = 1 : 2 lines N = 0 : 1 line F = 1 : 5 x 10 dots F = 0.5 x 7 dots BF = 1 : internal operation is being performed BF = 0 : instruction acceptable	DD RAM : Display Data RAM CG RAM : Character Generator RAM ACG : CG RAM Address ADD : DD RAM Address Corresponds to cursor address AC : Address Counter, used for both DD RAM and CG RAM * : Invalid
		fcp or fosc = 250 KHz However, when frequency changes, execution time also changes Example if fcp or fosc is 270KHz, 70μS x 250 / 270 = 37μS

