

## 6.2 Internal Register Map

### 6.2.1 Register 0: Temp ADC Output Register (Read Only, Address Pointer = 00000)

Bit #	D15	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0
Bit Name	AD15	AD14	AD13	AD12	AD11	AD10	AD9	AD8	AD7	AD6	AD5	AD4	AD3	AD2	AD1	AD0
POR Value	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

#### Bit Descriptions:

#### AD[15:0] Temp ADC Output

Internal Temperature Mode: 12-bit + sign extended, right justified, Two's Complement data format

External Temperature Mode: 15-bit + sign extended, right-justified, Two's Complement data format

Figure 6-1. Internal Temperature Mode; Register 6[9] = '1'.

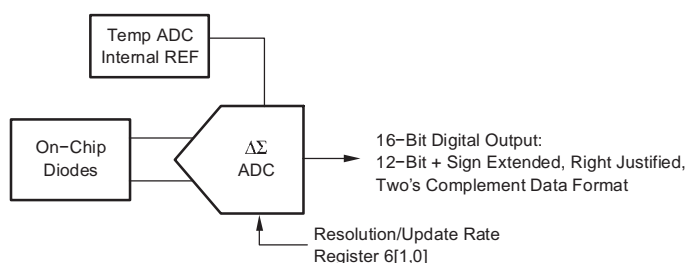


Table 6-2. Internal Temperature Mode-Data Format (12-Bit Resolution).  $T_{EN} = 1$ ;  $R_1, R_0 = '11'$

Temperature (°C)	Digital Output AD15.....AD0 (Binary)	Digital Output (Hex)
150	0000 1001 0110 0000	0960
128	0000 1000 0000 0000	0800
127.9375	0000 0111 1111 1111	07FF
100	0000 0110 0100 0000	0640
80	0000 0101 0000 0000	0500
75	0000 0100 1011 0000	04B0
50	0000 0011 0010 0000	0320
25	0000 0001 1001 0000	0190
0.25	0000 0000 0000 0100	0004
0.0	0000 0000 0000 0000	0000
-0.25	1111 1111 1111 1100	FFFC
-25	1111 1110 0111 0000	FE70
-55	1111 1100 1001 0000	FC90

NOTE: The resolution for the Temp ADC in Internal Temperature Mode is 0.0625°C/count.

For positive temperatures (for example, 50°C):

$(50^{\circ}\text{C}) / (0.0625^{\circ}\text{C/count}) = 800 \rightarrow 320\text{h} \rightarrow 0011\ 0010\ 0000$

50°C will be read by the Temp ADC as 0000 0011 0010 0000  $\rightarrow$  0320h

For negative temperatures (for example, -25°C):

$(|[-25]|) / (0.0625^{\circ}\text{C/count}) = 400 \rightarrow 190\text{h} \rightarrow 0001\ 1001\ 0000$

Convert to Two's Complement notation.

-25°C will be read by the Temp ADC as 1111 1110 0111 0000  $\rightarrow$  FE70h

Figure 6–2. External Signal Mode; Register 6 = '0000 0100 0011 0000'

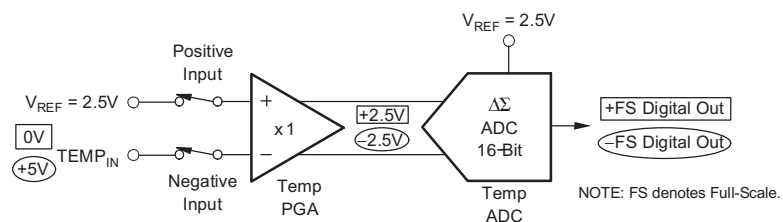


Table 6–3. External Signal Mode—Data Format Example (Register 6 = '0000 0100 0011 0011'), 15-Bit + Sign Resolution. REN = 1, RS = 1

TEMP <sub>IN</sub> (V)	Temp ADC Input (V)	Temp ADC Input (Ratio to Full Scale) <sup>(1)</sup>	Digital Output AD15.....AD0 (Binary)	Digital Output (Hex)
+0.0001	+2.49992371	+0.999969 V <sub>REFT</sub>	0111 1111 1111 1111	7FFF
+0.625	+1.875	+0.75 V <sub>REFT</sub>	0110 0000 0000 0000	6000
+1.25	+1.25	+0.5 V <sub>REFT</sub>	0100 0000 0000 0000	4000
+1.925	+0.575	+0.23 V <sub>REFT</sub>	0001 1101 0111 0001	1D71
+2.4999	+0.00007629	+(1/32768) V <sub>REFT</sub>	0000 0000 0000 0001	0001
+2.5	0	+0 V <sub>REFT</sub>	0000 0000 0000 0000	0000
+2.50007629	-0.00007629	-(1/32768) V <sub>REFT</sub>	1111 1111 1111 1111	FFFF
+3.075	-0.575	-0.23 V <sub>REFT</sub>	1110 0010 1000 1111	E28F
+3.75	-1.25	-0.5 V <sub>REFT</sub>	1100 0000 0000 0000	C000
+4.375	-1.875	-0.75 V <sub>REFT</sub>	1010 0000 0000 0000	A000
+5	-2.5	-1 V <sub>REFT</sub>	1000 0000 0000 0000	8000

<sup>(1)</sup> V<sub>REFT</sub> can be V<sub>SA</sub>, V<sub>EXC</sub>, or V<sub>REF</sub>.