

INTERNAL REFERENCE

The DAC8560 includes a 2.5V internal reference that is enabled by default. The internal reference is externally available at the V_{REF} pin. A minimum 100nF capacitor is recommended between the reference output and GND for noise filtering.

The internal reference of the DAC8560 is a bipolar transistor-based, precision bandgap voltage reference. The basic bandgap topology is shown in Figure 64. Transistors Q_1 and Q_2 are biased such that the current density of Q_1 is greater than that of Q_2 . The difference of the two base-emitter voltages ($V_{BE1} - V_{BE2}$) has a positive temperature coefficient and is forced across resistor R_1 . This voltage is gained up and added to the base-emitter voltage of Q_2 , which has a negative temperature coefficient. The resulting output voltage is virtually independent of temperature. The short-circuit current is limited by design to approximately 100mA.

Enable/Disable Internal Reference

The DAC8560 internal reference is enabled by default; however, the reference can be disabled for debugging or evaluation purposes. A serial command requiring at least two additional SCLK cycles at the end of the 24-bit write sequence (see Serial Interface section) must be used to disable the internal reference. For proper operation, a total of at least 26 SCLK cycles are required for each enable/disable internal reference update sequence, during which SYNC must be held low. To disable the internal reference, execute the write sequence illustrated in Table 1 followed by at least two additional SCLK falling edges while SYNC is low.

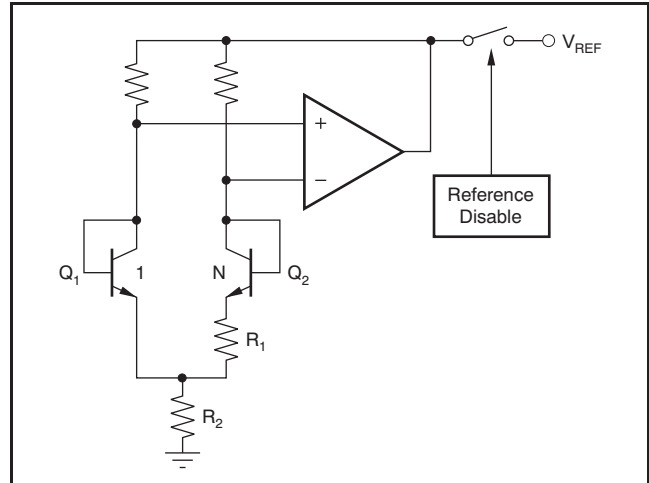


Figure 64. Simplified Schematic of the Bandgap Reference

To then enable the reference, either perform a power-cycle to reset the device, or sequentially execute the two write sequences in Table 2 and Table 3. Each of these write sequences must be followed by at least two additional SCLK falling edges while SYNC remains low.

During the time that the internal reference is disabled, the DAC will function normally using an external reference. At this point, the internal reference is disconnected from the V_{REF} pin (tri-state). Do not attempt to drive the V_{REF} pin externally and internally at the same time indefinitely.

Table 1. Write Sequence for Disabling the DAC8560 Internal Reference

DB23	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	DB0	
			4				8							4							0								1	

Table 2. Enabling the DAC8560 Internal Reference (Write Sequence 1 of 2)

DB23	0	1	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	DB0
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Table 3. Enabling the DAC8560 Internal Reference (Write Sequence 2 of 2)

DB23	0	1	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	DB0
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