DAC8565C material defect issue TEST REPORT

user material

TI **DAC8565ICPWR**

1. Problem

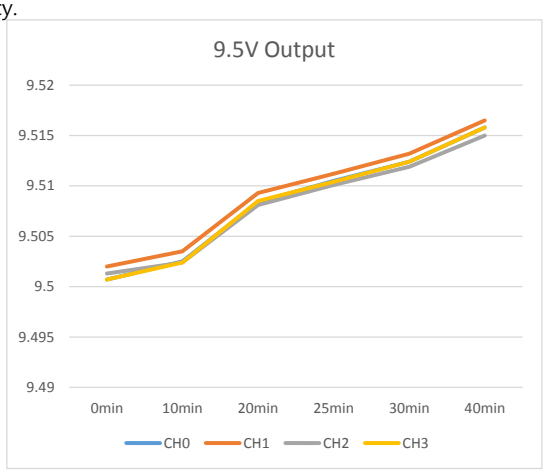
The value of the analog output gradually increases, failing to satisfy product accuracy.

GT-4428 Analog Voltage Output

9.5V OUT	0min	10min	20min	25min	30min	40min
CH0	9.5007	9.5025	9.5084	9.5105	9.5124	9.5158
CH1	9.502	9.5035	9.5093	9.5112	9.5132	9.5165
CH2	9.5013	9.5024	9.5081	9.5101	9.5119	9.515
CH3	9.5007	9.5024	9.5085	9.5104	9.5124	9.5158

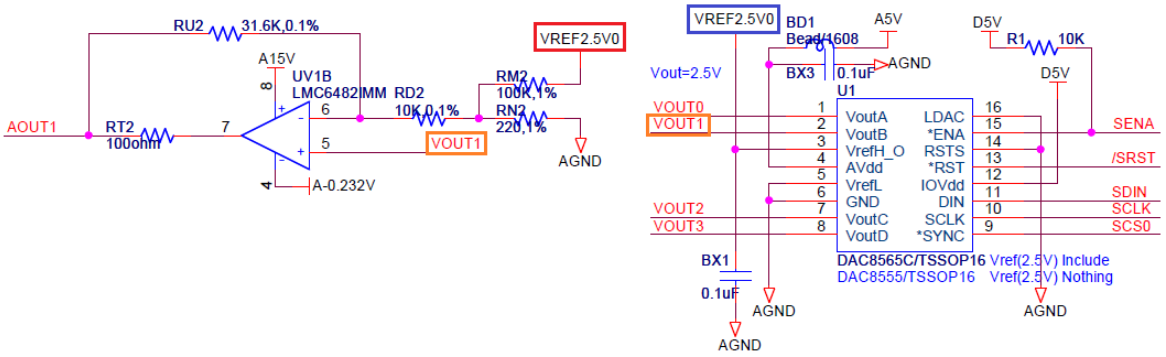
(unit : V)

* Normal value = 9.49V ~ 9.51V



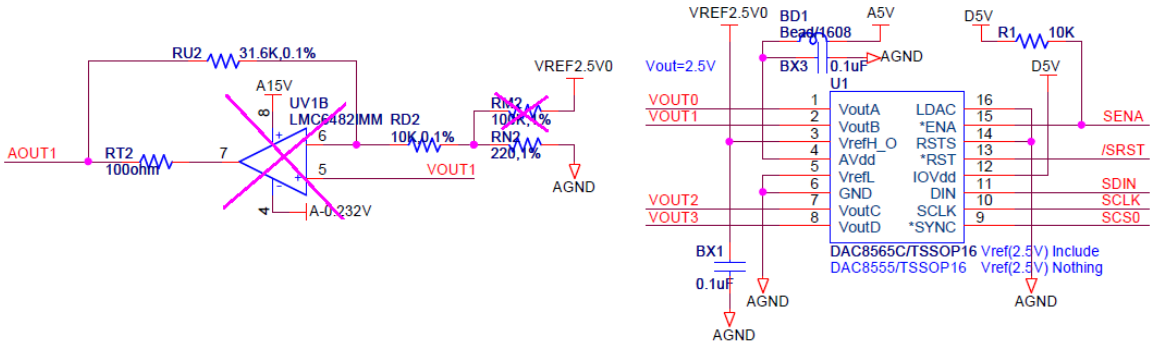
2. circuit used

-This is a circuit that receives the DAC value, amplifies it with an opamp, and outputs it. / VREF is using the DAC8565 internal reference voltage.
(Each VREF is used in 4 opamp amplifier circuits.)



3. Check DAC

-To only check the operation of the DAC, measurements were made without installing RMx/Uvx materials. (VOUT, VREF)

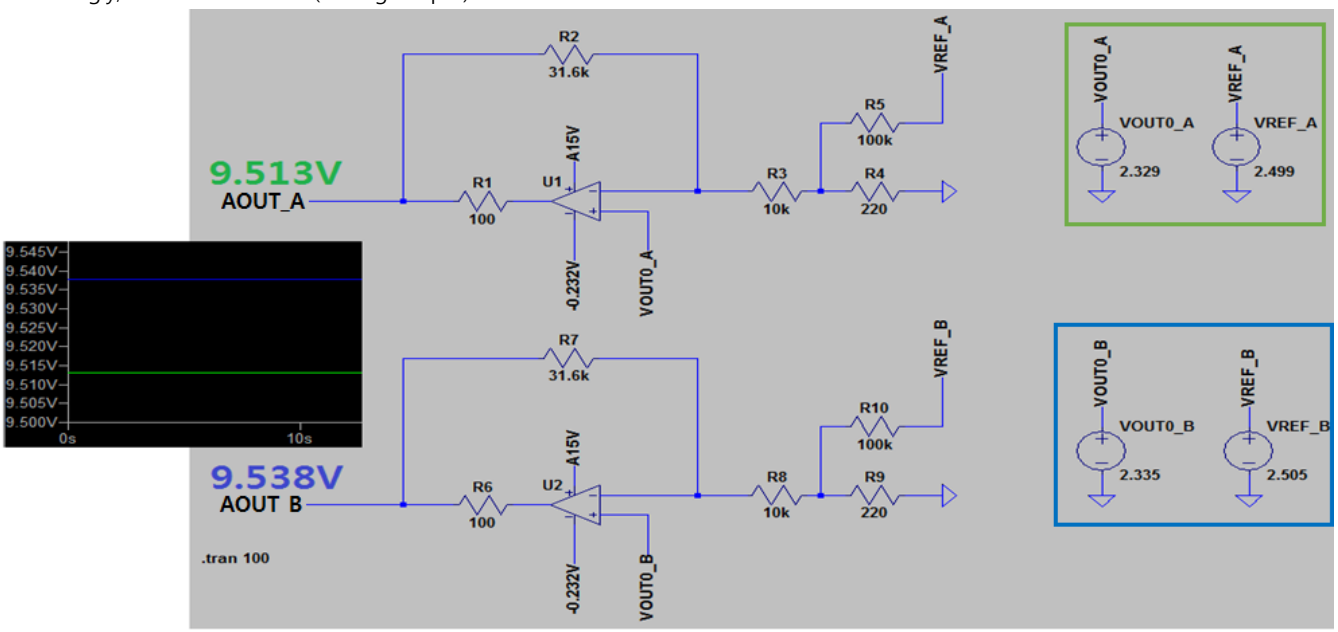


Initial Value		
VREF0	VOUT0	VOUT2
2.499	2.329	2.326
After 1hour		
VREF0	VOUT0	VOUT2
2.505	2.335	2.332

Voltage difference value(V)			Voltage difference rate(%)		
VREF0	VOUT0	VOUT2	VREF0	VOUT0	VOUT2
0.006	0.006	0.006	0.60%	0.60%	0.60%

4. Conclusion

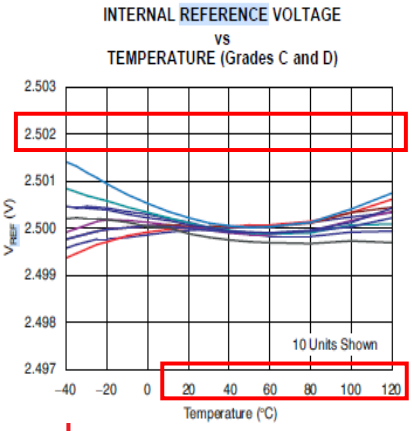
As shown in the table above, when VREF increases, VOUT increases.
Accordingly, the value of AOUT (Analog Output) in the calculation formula increases.

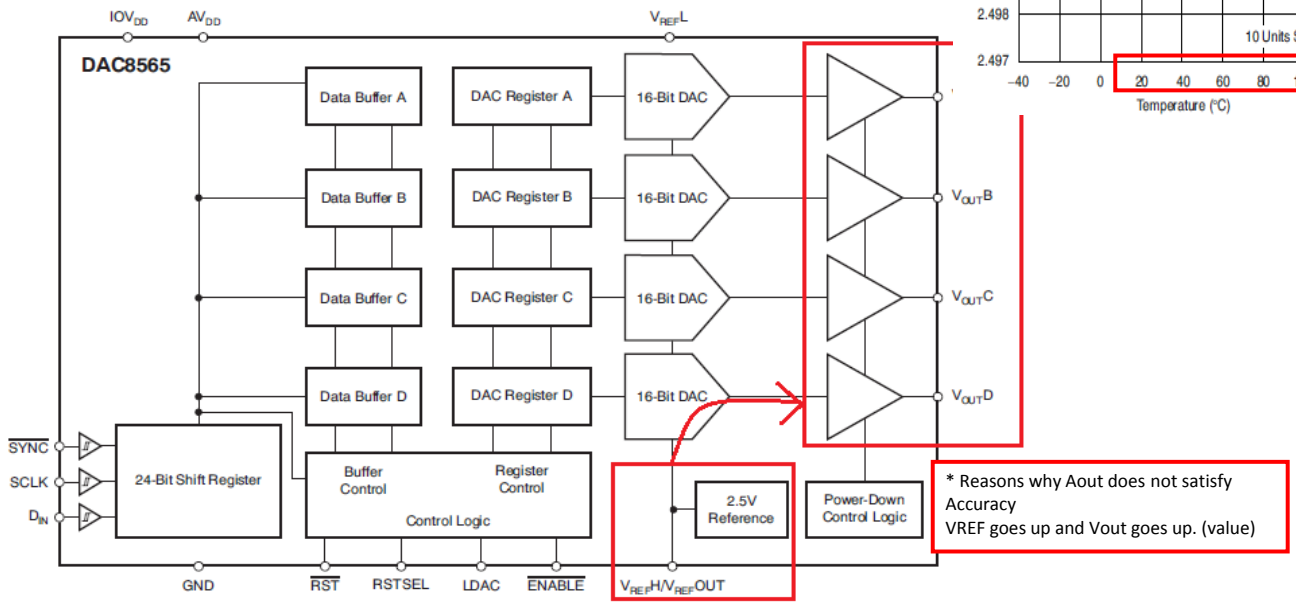


Checking the DAC datasheet (DAC8565C)
The specification of VREF voltage is max. 2.5025V, but measured higher than this.
the test was conducted at an ambient temperature of 25℃ and the material temperature was 45℃.
Temperature Condition : -40~105℃ //

At AV_{DD} = 2.7V to 5.5V, –40°C to +105°C range, and data format is straight binary (unless otherwise noted).

PARAMETER	TEST CONDITIONS	DAC8565 MIN	DAC8565 TYP	DAC8565 MAX	UNIT
REFERENCE OUTPUT					
Output voltage	T_A = +25°C	2.4975	2.5	2.5025	V
Initial accuracy	T_A = +25°C	–0.1	±0.004	0.1	%
Output voltage temperature drift	DAC8565A, DAC8565B[3]		5	25	ppm/°C
	DAC8565C, DAC8565D[4]		2	5	





* Reasons why Aout does not satisfy Accuracy
VREF goes up and Vout goes up. (value)

Products that did not have this phenomenon before, DAC value is stable.
Therefoe, it is suspected that the DAC material used this time is defective.

		Value(V)	**After 4hour**		Value(V)	Difference(V)	Difference rate(%)
fair quality	Ref0	2.502	fair quality	Ref0	2.503	0.001	0.10%
	Vout1	2.326		Vout1	2.327	0.001	0.10%
poor quality	REf1	2.502	poor quality	REf1	2.512	0.010	1.00%
(defective)	Vout4	2.325	(defective)	Vout4	2.334	0.009	0.90%