

# European IP Design Company

## OpAmp with ADC in TSMC 180nm

For this application, the focus was to generate two derivatives:

- A low current amplifier - shown in the fourth column
- A high GBW - shown in the fifth column

The requirements provided by the customer are in the second column and the specification values for their design are in the third column.

Specification	Requirement	Customer Design	Thalia low current solution	Thalia high GBW solution
Total Current Supply	<17.5 mA	17.5 mA	<b>8.1 mA</b>	15.7 mA
Component Area	<11000 $\mu\text{m}^2$	10500 $\mu\text{m}^2$	3362 $\mu\text{m}^2$	2361 $\mu\text{m}^2$
Atten_135MHz	<-46 db	-47.2 db	-49.0 db	-50.7 db
BW_3db	<44 MHz	41.4 MHz	41.4 MHz	37.5 MHz
LOOP_GAIN_at_10Hz	>50 db	54.3 db	78.3 db	60.5 db
LOOP_GAIN_MARGIN	>5 db	8.4 db	15.5 db	10.41 db
LOOP_GBW	>50 MHz	62.2 MHz	96.0 MHz	110.7 MHz
LOOP_PHASE_MARGIN	>60°	75.3°	67.7°	101.3°
LOOP_GAIN_MARGIN_dm	>10 db	22.3 db	33.6 db	19.0 db
LOOP_GBW_dm	>600 MHz	887.9 MHz	874.4 MHz	<b>2604.9 MHz</b>
Solutions evaluated*	-	-	160**	

\*Average number of simulated solutions required to reach first optimised solution.

\*\*Simulation time for each solution approximately 145 seconds. Total time using four simulators in parallel 1 hour 35 minutes.