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μPC5700 Series

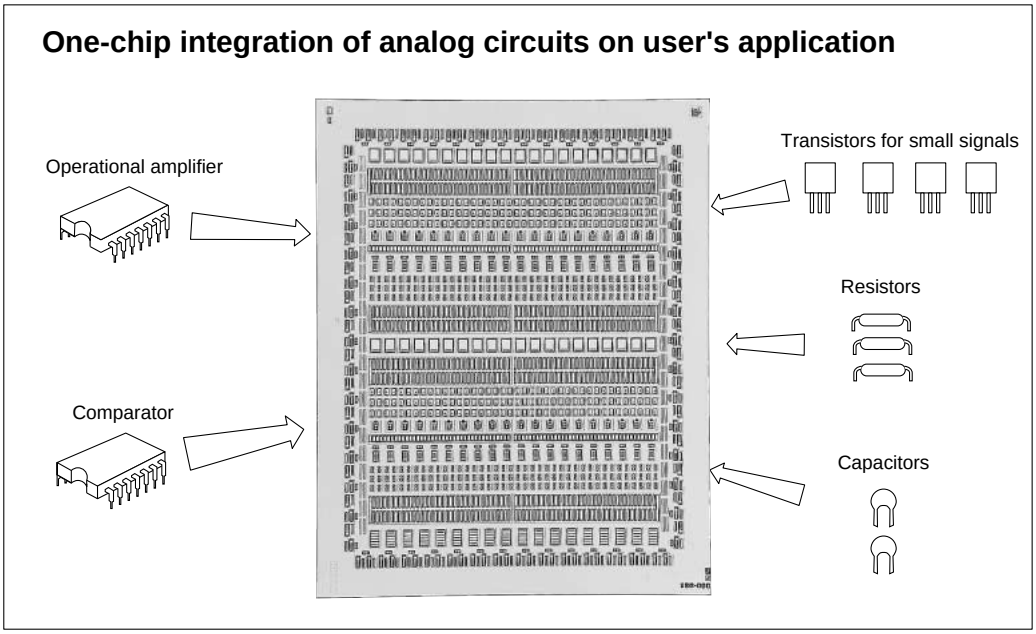
Analog Master Ⅱ (AM2 Family)

High-Precision Highly Integrated Analog ASIC with Superior Cost Performance

New Products

What Is an Analog Master?

An analog master is a semi-custom LSI for creating analog circuits on a master wafer by interconnecting pre-diffused elements (bipolar transistors, resistors, and capacitors) already formed on the wafer using user-defined wiring.
An analog master is ideal for users who want to develop small-lot analog LSIs at a low development cost and in a short development period.



Features

With the μPC5700 Series, NEC has enhanced its V-CHS process, which has a proven track record in analog ICs, to produce a new high-precision, highly integrated analog master family.

Integration 1.2 times higher than in existing products

- The μPC5700 Series incorporates 1.2 times more transistors than the existing μPC5020 Series, but with no increase in size
- Resistors can be mounted in numbers with a total resistance of three to four times that of the μPC5020 Series

Circuit characteristics featuring higher precision

- Variation in polysilicon resistance and transistor characteristics reduced through enhancement of process technology
- Use of operational amplifier with low offset voltage and high-precision voltage regulator

Superior cost performance

- Lower cost than existing analog masters
- Cost reduction achieved through higher integration, enhanced process technology, and optimal package selection

Product Lineup

Parameter			Part Number			
			μPC5701	μPC5702	μPC5703	μPC5704
Absolute maximum rating (supply voltage)			11V			
Number of pads			24	30	56	62
Number of ESD diodes			88	120	224	248
Number of transistors	NPN	Total	152	304	476	608
		DT2	126	252	396	504
		TT4	26	52	80	104
	PNP	Total	162	324	500	648
		LP1	120	240	368	480
		VP1	42	84	132	168
Number of resistors	Total (MΩ)		4.5	9.0	14.0	17.8
	1 kΩ		106	212	332	424
	10 kΩ		424	848	1328	1696
	3 kΩ		64	96	116	140
Number of capacitors (5 pF)			28	56	88	112

Caution Product quality may suffer if the absolute maximum rating is exceeded even momentarily. That is, the absolute maximum rating is the rated value at which the product is on the verge of suffering physical damage, and therefore the product must be used under conditions that ensure that the absolute maximum rating is not exceeded.

Package Lineup

Package	Pin Count	μPC5701	μPC5702	μPC5703	μPC5704	Body Size
SOP	20 pins					7.62 mm(300)
	24 pins					7.62 mm(300)
SSOP	16 pins	○	–	–	–	5.72 mm(225)
	20 pins	○	○	–	–	5.72 mm(225)
	24 pins	○	○	○	–	7.62 mm(300)
TSSOP	16 pins	○	–	–	–	5.72 mm(225)
QFP	48 pins	–	–	○	○	7 × 7 mm
	56 pins	–	–	–	○	10 × 10 mm
TQFP	48 pins	–	–	○	○	7 × 7 mm

Remark ○: Available Blank : Under study – : Not available

Library Lineup (Development Planned)

The same libraries are provided as for the existing analog masters.

Function	Library Name (Preliminary)	Features	Equivalent Packaged Product
Operational amplifier	OA01A	General purpose	μPC4558
	OA02A	Single power supply, high speed	μPC842
	OA03A	Low power	μPC4250
	OA04B	High input impedance	None
	OA06B	Signal power supply, stable	μPC358
	OA06C	Single power supply, V_{om^+} enhancement	μPC358
	OA07A	High speed, high stability	None
	OA07B	High speed, wide bandwidth	None
	OA08	Low noise	None
	OA09	General purpose (reduced elements)	None
	OA10	NPN input, low noise	None
Comparator	CP02A	High speed	μPC319
	CP04	Single power supply	μPC393
Regulator	RG01A	General purpose	None
	RG02A	General purpose	None
	RG03	Low saturation	None
Switch	SW01A	Bidirectional switch (active high)	None
	SW01B	Bidirectional switch (active low)	None
	SW02	Signal switch	None
Timer	TM01	Timer	μPC1555

Remark V_{om^+} : Maximum output voltage

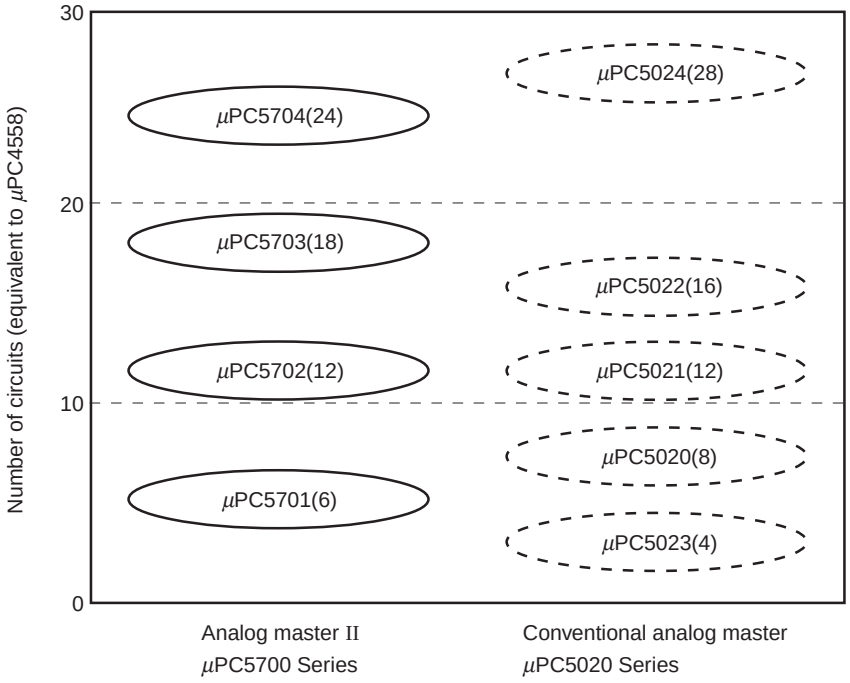
Elimination of high power supply variation, a wide D range, and a low offset have been achieved by mounting a high-precision analog circuit.

Function	Specification	Specified Value
Operational amplifier	Input offset voltage	±1 mV
	Slew-rate	100 V/μs minimum
Regulator	Output precision	Within ±2%
	Ripple elimination rate	60 dB (120 Hz) (Typ.)

Remark All values are target values.

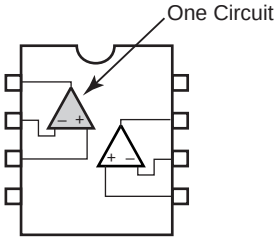
CIRCUIT SCALE

The scale of the circuit that can be integrated on the analog master differs depending on the product in each family.
The scale of the circuit that can be integrated here is roughly calculated in terms of the number of circuits, where one circuit is equivalent to the general-purpose operational amplifier μPC4558 Note 1.



(Numbers in the parentheses indicate the number of circuits Note 2 that can be integrated)

Notes 1. One of the two operational amplifiers in the general-purpose operational amplifier μPC4558 package (8-pin DIP) is counted as one circuit.



2. The number of circuits shown above is a guideline in which only operational amplifiers are integrated, and does not include operational amplifier peripheral circuits (such as feedback circuits).
When selecting a product, estimate the circuit scale by taking these peripheral circuits into consideration.

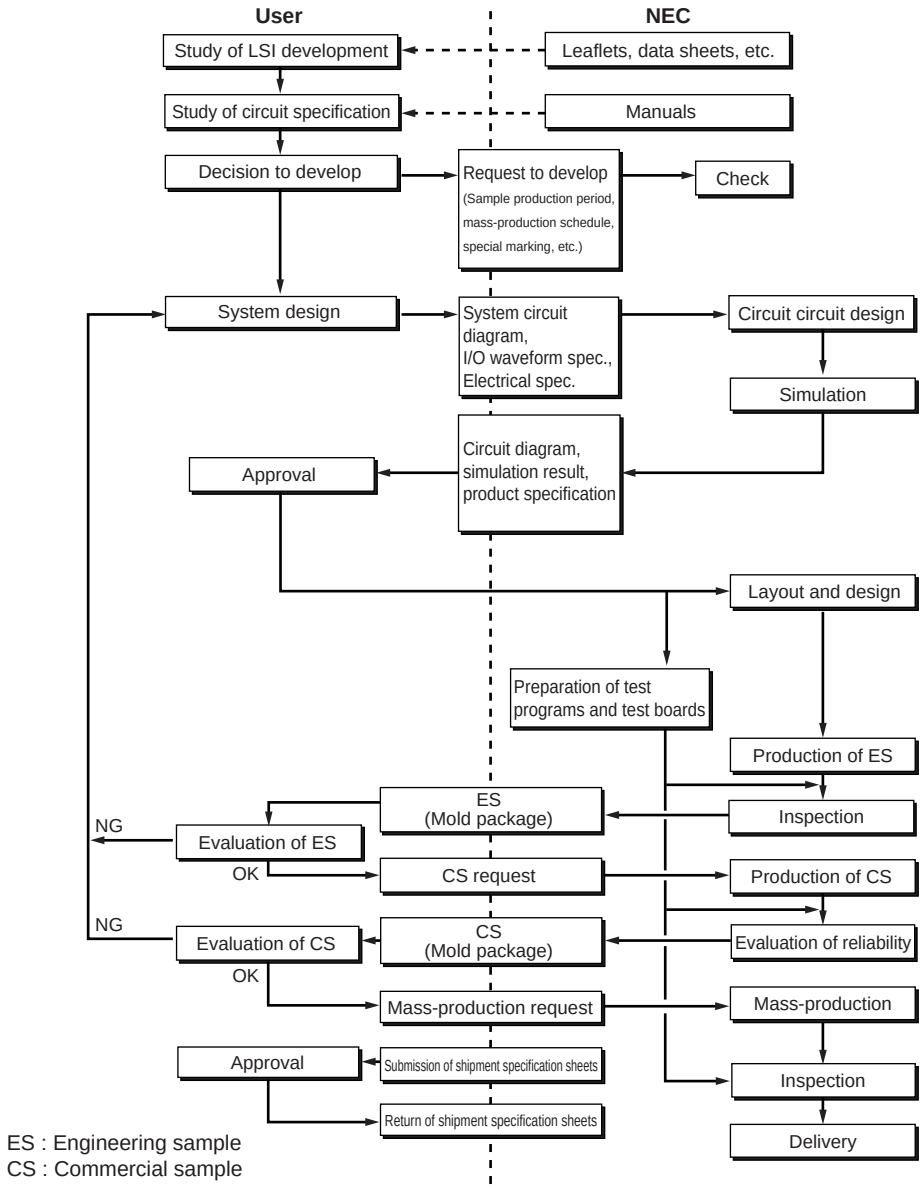
DEVELOPMENT OF μPC5700 SERIES

Development of the μPC5700 Series is completed by both the user and NEC. Passing the development work from the user to NEC is called interfacing, and should be conducted at the circuit-diagram level.

Circuit-diagram-level interfacing is where the user performs system circuit design and then passes the work to NEC, where the IC design and all development work from simulation onward is carried out.

DEVELOPMENT FLOW

Flow for circuit diagram level interface



Remark Unlike CS and mass-produced model, the quality of ES is not guaranteed. Therefore, do not use the ES for production or reliability testing.

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