



# VANTIS

BEYOND PERFORMANCE

## Product Menu

An AMD Company

### HIGHLIGHTS

**MACH® 1-5 CPLD Families**  
**Fastest speeds; Easiest-to-Use**  
**SpeedLocking™ (Fixed, Guaranteed Timing)**  
**32-512 Macrocells; 32-256 I/Os**  
**JTAG-ISP; 3.3-V or 5-V Solutions**  
**PCI-Compliance at 5, 7, 10 and 12ns**  
**EECMOS Technology Leadership**  
**Comprehensive SPLD Offering**

### MACH 5 Family

Family	Device	Package	Macrocells (PLD Gates)	I/Os	Dedicated Inputs	Output Enables	PT per Output	JTAG- ISP	Commercial		Ind'l <sup>1</sup>		I <sub>cc</sub> mA (Static)	
									t <sub>PD</sub> ns	f <sub>CNT</sub> MHz	t <sub>PD</sub> ns	t <sub>SS</sub> <sup>2</sup> ns		t <sub>CO</sub> <sup>3</sup> ns
MACH 5 128 M/C	M5LV-128/68-5	100 PQFP	128 (5,000)	68	4	16	Up to 32	Yes	5.5	167	7.5	3	4.5	35
	M5(LV)-128/68-7	100 TQFP							7.5	125	10	4	6	
	M5(LV)-128/68-10								10	100	12	5	7	
	M5(LV)-128/68-12								12	83.3	15	6	8	
	M5-128/68-15								15	83.3	20	8	10	
	M5LV-128/74-5	100 TQFP	128 (5,000)	74	4	16	Up to 32	Yes	5.5	167	7.5	3	4.5	35
	M5LV-128/74-7								7.5	125	10	4	6	
	M5LV-128/74-10								10	100	12	5	7	
	M5LV-128/74-12								12	83.3	15	6	8	
	M5LV-128/104-5	144 PQFP	128 (5,000)	104	4	16	Up to 32	Yes	5.5	167	7.5	3	4.5	35
	M5(LV)-128/104-7	144 TQFP							7.5	125	10	4	6	
	M5(LV)-128/104-10								10	100	12	5	7	
	M5(LV)-128/104-12								12	83.3	15	6	8	
	M5-128/104-15								15	83.3	20	8	10	
	M5LV-128/120-5	160 PQFP	128 (5,000)	120	4	16	Up to 32	Yes	5.5	167	7.5	3	4.5	35
	M5(LV)-128/120-7								7.5	125	10	4	6	
M5(LV)-128/120-10		10							100	12	5	7		
M5(LV)-128/120-12		12							83.3	15	6	8		
M5-128/120-15		15							83.3	20	8	10		
MACH 5 192 M/C	M5-192/68-7	100 PQFP	192 (7,500)	68	4	24	Up to 32	Yes	7.5	125	10	4	6	45
	M5-192/68-10	100 TQFP							10	100	12	5	7	
	M5-192/68-12								12	83.3	15	6	8	
	M5-192/68-15								15	83.3	20	8	10	
	M5-192/104-7	144 PQFP	192 (7,500)	104	4	24	Up to 32	Yes	7.5	125	10	4	6	45
	M5-192/104-10								10	100	12	5	7	
	M5-192/104-12								12	83.3	15	6	8	
	M5-192/104-15								15	83.3	20	8	10	
	M5-192/120-7	160 PQFP	192 (7,500)	120	4	24	Up to 32	Yes	7.5	125	10	4	6	45
	M5-192/120-10								10	100	12	5	7	
	M5-192/120-12								12	83.3	15	6	8	
	M5-192/120-15								15	83.3	20	8	10	
	M5-192/160-7	208 PQFP	192 (7,500)	160	4	24	Up to 32	Yes	7.5	125	10	4	6	45
	M5-192/160-10								10	100	12	5	7	
	M5-192/160-12								12	83.3	15	6	8	
	M5-192/160-15								15	83.3	20	8	10	
MACH 5 256 M/C	M5LV-256/68-5	100 PQFP	256 (10,000)	68	4	32	Up to 32	Yes	5.5	167	7.5	3	4.5	55
	M5(LV)-256/68-7	100 TQFP							7.5	125	10	4	6	
	M5(LV)-256/68-10								10	100	12	5	7	
	M5(LV)-256/68-12								12	83.3	15	6	8	
	M5-256/68-15								15	83.3	20	8	10	
	M5LV-256/74-5	100 TQFP	256 (10,000)	74	4	32	Up to 32	Yes	5.5	167	7.5	3	4.5	55
	M5LV-256/74-7								7.5	125	10	4	6	
	M5LV-256/74-10								10	100	12	5	7	
	M5LV-256/74-12								12	83.3	15	6	8	
	M5LV-256/74-15								15	83.3	20	8	10	

\*VANT500018\*

**MACH 5 Family (Cont'd)**

Family	Device	Package	Macrocells (PLD Gates)	I/Os	Dedicated Inputs	Output Enables	PT per Output	JTAG- ISP	Commercial		Ind <sup>1</sup> ns	t <sub>SS</sub> <sup>2</sup> ns	t <sub>CO</sub> <sup>3</sup> ns	I <sub>CC</sub> mA (Static)		
									t <sub>PD</sub> ns	f <sub>CNT</sub> MHz						
MACH 5 256 M/C	M5LV-256/104-5 M5(LV)-256/104-7 M5(LV)-256/104-10 M5(LV)-256/104-12 M5-256/104-15	144 PQFP, 144 TQFP	256 (10,000)	104	4	32	Up to 32	Yes	5.5 7.5 10 12 15	167 125 100 83.3 83.3	7.5 10 12 15 20	3 4 5 6 8	4.5 6 7 8 10	55		
	M5LV-256/120-5 M5(LV)-256/120-7 M5(LV)-256/120-10 M5(LV)-256/120-12 M5-256/120-15	160 PQFP	256 (10,000)	120	4	32	Up to 32	Yes	5.5 7.5 10 12 15	167 125 100 83.3 83.3	7.5 10 12 15 20	3 4 5 6 8	4.5 6 7 8 10	55		
	M5LV-256/160-5 M5(LV)-256/160-7 M5(LV)-256/160-10 M5(LV)-256/160-12 M5-256/160-15	208 PQFP	256 (10,000)	160	4	32	Up to 32	Yes	5.5 7.5 10 12 15	167 125 100 83.3 83.3	7.5 10 12 15 20	3 4 5 6 8	4.5 6 7 8 10	55		
	MACH 5 320 M/C	M5(LV)-320/120-7 M5(LV)-320/120-10 M5(LV)-320/120-12 M5(LV)-320/120-15	160 PQFP	320 (12,500)	120	4	40	Up to 32	Yes	7.5 10 12 15	125 100 83.3 83.3	10 12 15 20	4 5 6 8	6 7 8 10	70	
		M5(LV)-320/160-7 M5(LV)-320/160-10 M5(LV)-320/160-12 M5(LV)-320/160-15	208 PQFP	320 (12,500)	160	4	40	Up to 32	Yes	7.5 10 12 15	125 100 83.3 83.3	10 12 15 20	4 5 6 8	6 7 8 10	70	
		M5(LV)-320/184-7 M5(LV)-320/184-10 M5(LV)-320/184-12 M5(LV)-320/184-15	240 PQFP	320 (12,500)	184	4	40	Up to 32	Yes	7.5 10 12 15	125 100 83.3 83.3	10 12 15 20	4 5 6 8	6 7 8 10	70	
		M5(LV)-320/192-7 M5(LV)-320/192-10 M5(LV)-320/192-12 M5(LV)-320/192-15	256 BGA	320 (12,500)	192	4	40	Up to 32	Yes	7.5 10 12 15	125 100 83.3 83.3	10 12 15 20	4 5 6 8	6 7 8 10	70	
		MACH 5 384 M/C	M5(LV)-384/120-7 M5(LV)-384/120-10 M5(LV)-384/120-12 M5(LV)-384/120-15	160 PQFP	384 (15,000)	120	4	48	Up to 32	Yes	7.5 10 12 15	125 100 83.3 83.3	10 12 15 20	4 5 6 8	6 7 8 10	75
			M5(LV)-384/160-7 M5(LV)-384/160-10 M5(LV)-384/160-12 M5(LV)-384/160-15	208 PQFP	384 (15,000)	160	4	48	Up to 32	Yes	7.5 10 12 15	125 100 83.3 83.3	10 12 15 20	4 5 6 8	6 7 8 10	75
			M5(LV)-384/184-7 M5(LV)-384/184-10 M5(LV)-384/184-12 M5(LV)-384/184-15	240 PQFP	384 (15,000)	184	4	48	Up to 32	Yes	7.5 10 12 15	125 100 83.3 83.3	10 12 15 20	4 5 6 8	6 7 8 10	75
			M5(LV)-384/192-7 M5(LV)-384/192-10 M5(LV)-384/192-12 M5(LV)-384/192-15	256 BGA	384 (15,000)	192	4	48	Up to 32	Yes	7.5 10 12 15	125 100 83.3 83.3	10 12 15 20	4 5 6 8	6 7 8 10	75
			MACH 5 512 M/C	M5(LV)-512/120-7 M5(LV)-512/120-10 M5(LV)-512/120-12 M5(LV)-512/120-15	160 PQFP	512 (20,000)	120	4	64	Up to 32	Yes	7.5 10 12 15	125 100 83.3 83.3	10 12 15 20	4 5 6 8	6 7 8 10
M5(LV)-512/160-7 M5(LV)-512/160-10 M5(LV)-512/160-12 M5(LV)-512/160-15				208 PQFP	512 (20,000)	160	4	64	Up to 32	Yes	7.5 10 12 15	125 100 83.3 83.3	10 12 15 20	4 5 6 8	6 7 8 10	100
M5(LV)-512/184-7 M5(LV)-512/184-10 M5(LV)-512/184-12 M5(LV)-512/184-15				240 PQFP	512 (20,000)	184	4	64	Up to 32	Yes	7.5 10 12 15	125 100 83.3 83.3	10 12 15 20	4 5 6 8	6 7 8 10	100
M5(LV)-512/192-7 M5(LV)-512/192-10 M5(LV)-512/192-12 M5(LV)-512/192-15				256 BGA	512 (20,000)	192	4	64	Up to 32	Yes	7.5 10 12 15	125 100 83.3 83.3	10 12 15 20	4 5 6 8	6 7 8 10	100
M5(LV)-512/256-7 M5(LV)-512/256-10 M5(LV)-512/256-12 M5(LV)-512/256-15	352 BGA			512 (20,000)	256	4	64	Up to 32	Yes	7.5 10 12 15	125 100 83.3 83.3	10 12 15 20	4 5 6 8	6 7 8 10	100	

## MACH 4 Family

Family	Device	Package	Macrocells (PLD Gates)	I/Os	Dedicated Inputs	Output Enables	PT per Output (w/ NO speed adder)	Flip- Flops	JTAG- ISP	Commercial		Ind'l <sup>1</sup>		I <sub>CC</sub> mA (Static)	
										t <sub>PD</sub> ns	f <sub>CNT</sub> MHz	t <sub>PD</sub> ns	t <sub>SS</sub> <sup>2</sup> ns		t <sub>CO</sub> <sup>3</sup> ns
MACH 4	M4(LV)-32/32-7 M4(LV)-32/32-10 M4(LV)-32/32-12 M4(LV)-32/32-15	44PLCC, 44TQFP, 48TQFP	32 (1,250)	32	2	32	Up to 20	32	Yes	7.5 10 12 15	133 100 83.3 66.6	10 12 14 18	5.5 6 7 10	5.5 6.5 8 10	25
	M4(LV)-64/32-7 M4(LV)-64/32-10 M4(LV)-64/32-12 M4(LV)-64/32-15	44PLCC, 44TQFP, 48TQFP	64 (2,500)	32	2	32	Up to 20	96	Yes	7.5 10 12 15	133 100 83.3 66.6	10 12 14 18	5.5 6 7 10	5.5 6.5 8 10	25
	M4(LV)-96/48-7 M4(LV)-96/48-10 M4(LV)-96/48-12 M4(LV)-96/48-15	100TQFP	96 (3,750)	48	8	48	Up to 20	144	Yes	7.5 10 12 15	133 100 83.3 66.6	10 12 14 18	5.5 6 7 10	5.5 6.5 8 10	50
	M4-96/96-15	144PQFP	96 (3,750)	96	6	96	Up to 20	96	Yes	15	66.6	20	10	10	188
	M4(LV)-128N/64-7 M4(LV)-128N/64-10 M4(LV)-128N/64-12 M4(LV)-128N/64-15	84PLCC	128 (5,000)	64	6	64	Up to 20	192	No	7.5 10 12 15	133 100 83.3 66.6	10 12 14 18	5.5 6 7 10	5.5 6.5 8 10	70
	M4(LV)-128/64-7 M4(LV)-128/64-10 M4(LV)-128/64-12 M4(LV)-128/64-15	100PQFP, 100TQFP	128 (5,000)	64	6	64	Up to 20	192	Yes	7.5 10 12 15	133 100 83.3 66.6	10 12 14 18	5.5 6 7 10	5.5 6.5 8 10	70
	M4(LV)-192/96-7 M4(LV)-192/96-10 M4(LV)-192/96-12 M4(LV)-192/96-15	144TQFP	192 (7,500)	96	16	96	Up to 20	288	Yes	7.5 10 12 15	133 100 83.3 66.6	10 12 14 18	5.5 6 7 10	5.5 6.5 8 10	85
	M4(LV)-256/128-7 M4(LV)-256/128-10 M4(LV)-256/128-12 M4(LV)-256/128-15	208PQFP, 256BGA	256 (10,000)	128	14	128	Up to 20	384	Yes	7.5 10 12 15	133 100 83.3 66.6	10 12 14 18	5.5 6 7 10	5.5 6.5 8 10	100

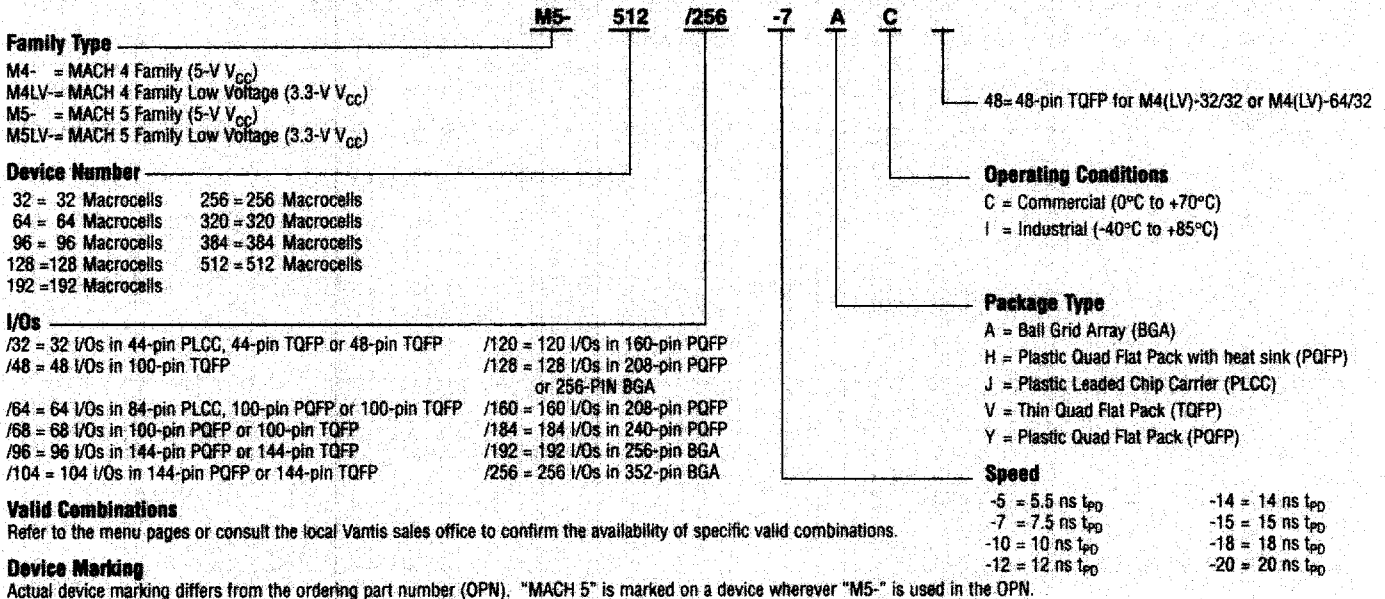
NOTE: M4 devices reflect a new nomenclature. A brief cross reference is provided below:

OLD OPN	NEW M4 OPN
MACH355---->	M4-96/96
MACH436---->	M4-128N/64
MACH446---->	M4-128/64
MACH466---->	M4-256/128

## Product Ordering Information

### MACH 4 and MACH 5 Families

Vantis programmable logic products are available with several ordering options. The order number (Valid Combination) is formed by a combination of:



### Valid Combinations

Refer to the menu pages or consult the local Vantis sales office to confirm the availability of specific valid combinations.

### Device Marking

Actual device marking differs from the ordering part number (OPN). "MACH 5" is marked on a device wherever "M5-" is used in the OPN.

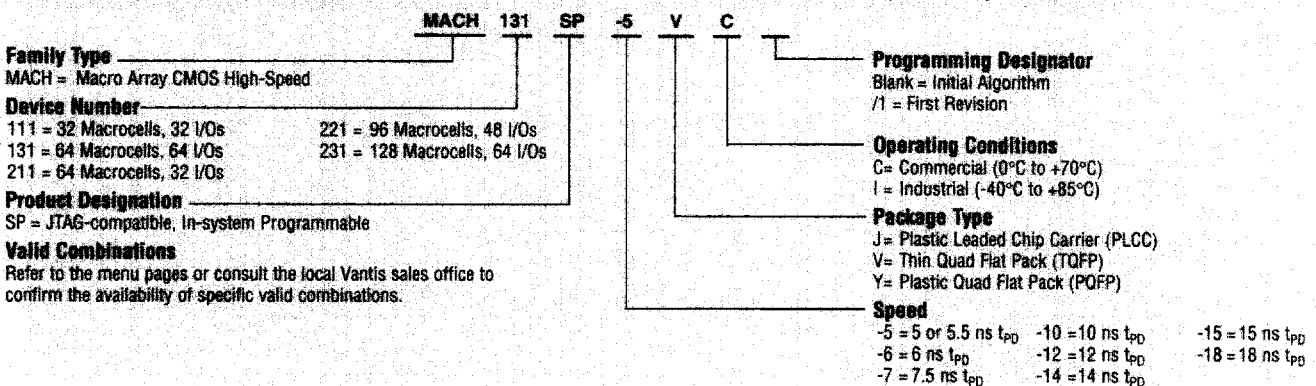
# MACH 1 / MACH 2 Family

Family	Device	Package	Macrocells (PLD Gates)	I/Os	Dedicated Inputs	Output Enables	PT per Output (w/ NO speed adder)	JTAG- ISP	Commercial		Ind <sup>1</sup>		t <sub>CO</sub> <sup>3</sup> ns	I <sub>CC</sub> mA (Static)
									t <sub>PD</sub> ns	t <sub>CNT</sub> MHz	t <sub>PD</sub> ns	t <sub>SS</sub> <sup>2</sup> ns		
MACH 1	MACH111-5	44PLCC, 44TQFP	32 (1250)	32	6	8	Up to 12	No	5	182	7.5	3.5	3.5	40
	MACH111-7								7.5	133	10	5.5		
	MACH111-10								10	100	12	6.5		
	MACH111-12								12	76.9	14	7		
	MACH111-15								15	66.6	18	10		
	MACH131-5	84PLCC	64 (2500)	64	6	16	Up to 12	No	5.5	182	7.5	3.5	4	75
	MACH131-7								7.5	133	10	5.5		
	MACH131-10								10	100	12	6.5		
	MACH131-12								12	76.8	14	7		
	MACH131-15								15	66.6	18	10		
MACH 2	MACH211-7	44PLCC, 44TQFP	64 (2500)	32	6	8	Up to 16	No	7.5	133	10	5.5	5	40
	MACH211-10								10	100	12	6.5		
	MACH211-12								12	83.3	14	7		
	MACH211-15								15	66.6	18	10		
	MACH221-7	68PLCC	96 (3750)	48	8	16	Up to 16	No	7.5	133	10	5.5	5	70
	MACH221-10								10	100	12	6.5		
	MACH221-12								12	83.3	14	7		
	MACH221-15								15	66.6	18	10		
	MACH231-6	84PLCC	128 (5000)	64	6	16	Up to 16	No	6	166	-	5	4	135
	MACH231-7								7.5	133	-	5.5		
	MACH231-10								10	100	12	6.5		
	MACH231-12								12	83.3	14	7		
MACH231-15	15								66.6	18	10			
MACH 1 ISP	MACH111SP-5	44PLCC, 44TQFP	32 (1250)	32	2	8	Up to 12	Yes	5	182	7.5	3.5	3.5	45
	MACH111SP-7								7.5	133	10	5.5		
	MACH111SP-10								10	100	12	6.5		
	MACH111SP-12								12	76.9	14	7		
	MACH111SP-15								15	66.6	18	10		
	MACH131SP-5	100PQFP, 100TQFP	64 (2500)	64	6	16	Up to 12	Yes	5.5	182	7.5	3.5	4	75
	MACH131SP-7								7.5	133	10	5.5		
	MACH131SP-10								10	100	12	6.5		
	MACH131SP-12								12	76.8	14	7		
	MACH131SP-15								15	66.6	18	10		
MACH 2 ISP	MACH211SP-6	44PLCC, 44TQFP	64 (2500)	32	2	8	Up to 16	Yes	6	166	-	5	4	40
	MACH211SP-7								7.5	133	10	5.5		
	MACH211SP-10								10	100	12	6.5		
	MACH211SP-12								12	83.3	14	7		
	MACH211SP-15	15	66.6	18	10									
	MACH221SP-7	100PQFP,	96 (3750)	48	8	16	Up to 16	Yes	7.5	133	10	5.5	5	70
	MACH221SP-10								10	100	12	6.5		
	MACH221SP-12								12	83.3	14	7		
	MACH221SP-15								15	66.6	18	10		
	MACH231SP-10	100PQFP, 100TQFP	128 (5000)	64	6	16	Up to 16	Yes	10	100	12	6.5	6.5	90
	MACH231SP-12								12	83.3	14	7		
	MACH231SP-15								15	66.6	18	10		

## Product Ordering Information

### MACH 1 and MACH 2 Families

Vantis programmable logic products are available with several ordering options. The order number (Valid Combination) is formed by a combination of:



### Universal CMOS PAL® Family

Family	Device	Package	I/Os	Dedicated Inputs	PT per Output	Features	Commercial		Ind <sup>1</sup>		t <sub>CO</sub> <sup>3</sup> ns	I <sub>CC</sub> mA	
							t <sub>PD</sub> ns	f <sub>CNT</sub> MHz	t <sub>PD</sub> ns	t <sub>SS</sub> <sup>2</sup> ns			
16V8	PALCE16V8H-5	20J	8	10	8	Half Power CMOS PAL Device	5	166	-	3	4	125	
	PALCE16V8H-7	20P, S, J					7.5	125	-	5	5	115	
	PALCE16V8H-10						10	71.4	10	7.5	7.5	115	
	PALCE16V8H-15	20P, J	15	50	15	12	10	90					
	PALCE16V8H-25		25	40	25	13	11	90					
	16V8	PALCE16V8Q-10	20P, J	8	10	8	Quarter Power CMOS PAL Device	10	71.4	-	7.5	7.5	55
PALCE16V8Q-15		20P, J	15					50	15	12	10	55	
PALCE16V8Q-20		20P, J	-	-	20	13	11	65					
PALCE16V8Q-25			25	40	25	15	12	55					
20V8		PALCE20V8H-5	28J	8	14	8	Half Power CMOS PAL Device	5	166	-	3	4	125
	PALCE20V8H-7	24P, 28J	7.5					125	-	5	5	115	
	PALCE20V8H-10		10					71.4	-	7.5	7.5	115	
	PALCE20V8H-15	24P, 28J	15	50	15	12	10	90					
	PALCE20V8H-25		25	40	25	15	12	90					
	20V8	PALCE20V8Q-10	24P, 28J	8	14	8	Quarter Power CMOS PAL Device	10	71.4	-	7.5	7.5	55
		PALCE20V8Q-15						15	50	-	12	10	55
		PALCE20V8Q-20	-	-	20	13	11	65					
		PALCE20V8Q-25	25	40	25	15	12	55					
		22V10	PALCE22V10H-5	28J	10	12	8 to 16	Half Power Varied Prod Term Distribution Bus-Friendly™	5	150	-	3	4
PALCE22V10H-7	24P, 28J		7.5	133					-	4.5	4.5	115	
PALCE22V10H-10	24P, S, 28J		10	110					10	6	6	120	
PALCE22V10H-15	24P, 28J, S		15	58.8					15	10	10	90	
PALCE22V10H-20	24P, 28J		-	-					20	12	12	100	
PALCE22V10H-25	24P, S, 28J		25	35.7					25	15	15	90	
PALCE22V10Q-10	24P, 28J		10	12	8 to 16	Quarter Power Bus-Friendly	10	110	-	6	6	55	
PALCE22V10Q-15	24P, 28J	15	58.8	-	10	10	55						
PALCE22V10Q-25		25	35.7	-	15	15	55						
24V10	PALCE24V10H-15	28P, J	10	16	8	CMOS PAL Device	15	66	-	10	10	115	
	PALCE24V10H-25	25					50	-	12	12	115		
26V12	PALCE26V12H-7	28J	12	14	8 to 16	Adv. 22V10 M/C Bus-Friendly	7.5	125	-	3.5	6	115	
	PALCE26V12H-10	28P, J					10	105	10	5	9	115	
	PALCE26V12H-15						15	58.8	15	10	10	105	
	PALCE26V12H-20						20	43	20	13	12	105	
29M16	PALCE29M16H-25	24P, 28J	16	5	8 to 16	Adv. Macrocell	25	33.3	-	15	15	100	

### Zero Power CMOS PAL Family

Family	Device	Package	I/Os	Dedicated Inputs	PT per Output	Features	Commercial		Ind <sup>1</sup>		t <sub>CO</sub> <sup>3</sup> ns	I <sub>CC</sub> mA
							t <sub>PD</sub> ns	f <sub>CNT</sub> MHz	t <sub>PD</sub> ns	t <sub>SS</sub> <sup>2</sup> ns		
16V8	PALCE16V8Z-12	20P, J	8	10	8	Zero Power CMOS PAL Device	-	-	12	8	8	0.03
	PALCE16V8Z-15						-	-	15	10	10	0.015
	PALCE16V8Z-25	20P, S, J					25	50	25	20	10	0.015
22V10	PALCE22V10Z-15	24P, 28J	10	12	8 to 16	Zero Power	-	-	15	10	10	0.03
	PALCE22V10Z-25	24P, S, 28J					25	35.7	25	15	15	0.03

### 3.3V Low Voltage CMOS PAL Family

Family	Device	Package	I/Os	Dedicated Inputs	PT per Output	Features	Commercial		Ind <sup>1</sup>		t <sub>CO</sub> <sup>3</sup> ns	I <sub>CC</sub> mA
							t <sub>PD</sub> ns	f <sub>CNT</sub> MHz	t <sub>PD</sub> ns	t <sub>SS</sub> <sup>2</sup> ns		
16V8	PALLV16V8-10	20P, S, J	8	10	8	3.3V	10	83.3	-	7	7	55
	PALLV16V8-20	20P, J				3.3V, Zero Power	-	-	20	15	10	0.03
22V10	PALLV22V10-7	28J	10	12	8 to 16	3.3V	7.5	133	-	4.5	5.5	75
	PALLV22V10-10	24P, 28J					10	110	-	5.5	6.5	60
							15	58.8	15	10	10	60
	PALLV22V10Z-25	24P, 28J					3.3V, Zero Power	-	-	25	15	15

## Asynchronous Universal PAL Family

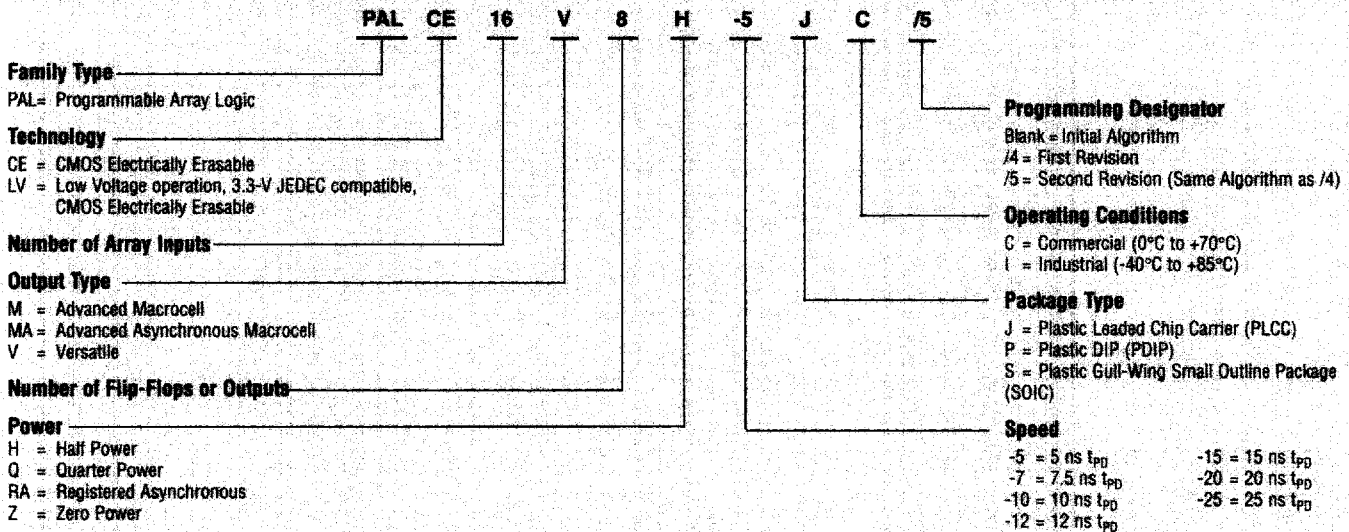
Family	Device	Package	I/Os	Dedicated Inputs	PT per Output	Features	Commercial		Ind'l <sup>1</sup>		I <sub>CC</sub> mA	
							t <sub>PD</sub> ns	f <sub>CNT</sub> MHz	t <sub>PD</sub> ns	t <sub>SS</sub> <sup>2</sup> ns		t <sub>CO</sub> <sup>3</sup> ns
610	PALCE610H-15	24P, 28J	16	4	8	J-K F/F Programmable CLK	15	76.1	-	12	8	90
	25						40	-	15	12	90	
20RA10	PALCE20RA10H-7	28J	10	10	4	Programmable CLK	7.5	100*	7.5	2.5	7.5	100
	PALCE20RA10H-10	24P, 28J					10	76.9*	10	3	10	100
	PALCE20RA10H-15						15	52.6*	15	4	15	100
	PALCE20RA10H-20						20	37*	20	4	20	90
29MA16	PALCE29MA16H-25	24P, 28J	16	5	4 to 12	Prog. CLK, Adv M/C	25	33.3	-	15	15	100

\* Specified as f<sub>MAX</sub> (External Feedback)

## Product Ordering Information

### CMOS PAL Family

Vantis programmable logic products are available with several ordering options. The order number (Valid Combination) is formed by a combination of:



### Valid Combinations

Refer to the menu pages or consult the local Vantis sales office to confirm the availability of specific valid combinations.

### Notes:

- MACH devices are dual-marked with both commercial and industrial speeds while CMOS PAL devices are marked separately.
- Minimum setup time from input, I/O, or feedback to clock.
- Maximum time from clock to output.

### Trademarks

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Please consult your local Vantis sales channel to verify availability or lead time of any device shown in this menu.

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