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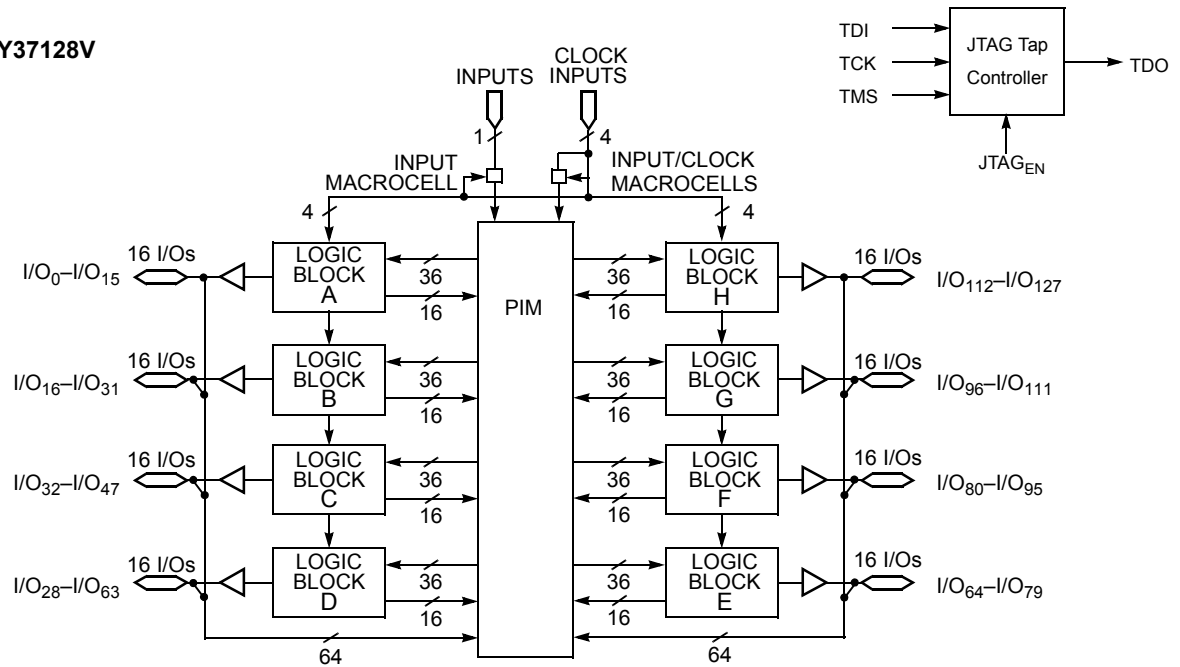
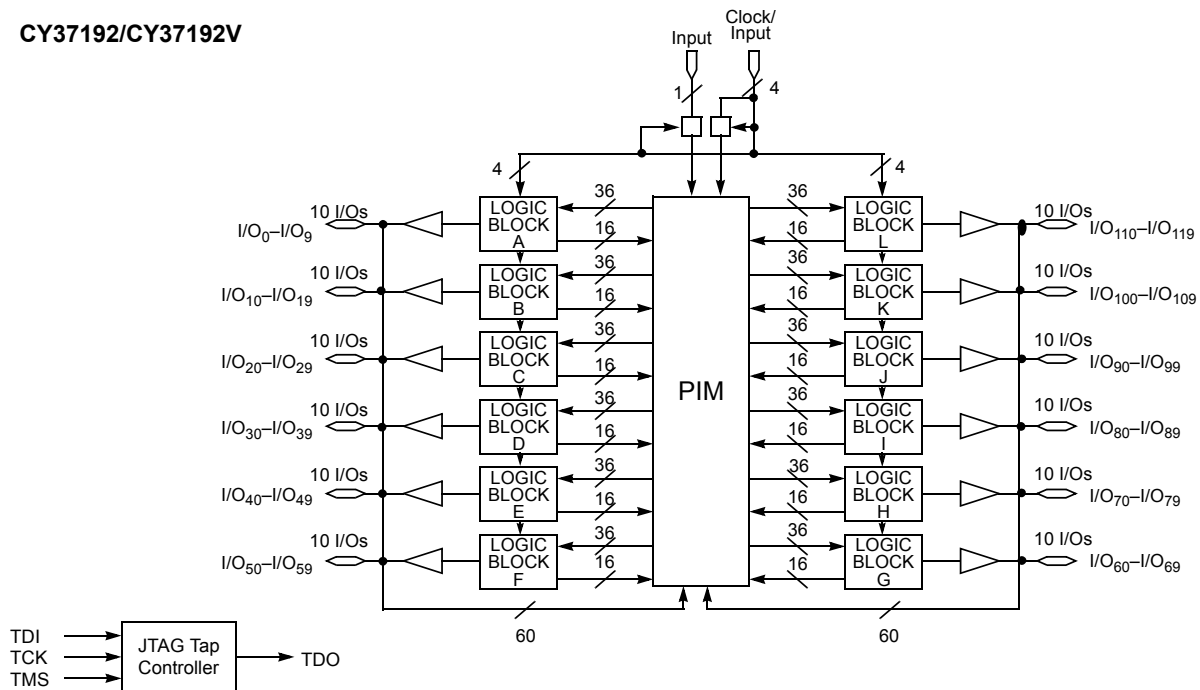
Understanding [Embedded - CPLDs \(Complex Programmable Logic Devices\)](#)

Embedded - CPLDs, or Complex Programmable Logic Devices, are highly versatile digital logic devices used in electronic systems. These programmable components are designed to perform complex logical operations and can be customized for specific applications. Unlike fixed-function ICs, CPLDs offer the flexibility to reprogram their configuration, making them an ideal choice for various embedded systems. They consist of a set of logic gates and programmable interconnects, allowing designers to implement complex logic circuits without needing custom hardware.

Applications of Embedded - CPLDs

Details

Product Status	Obsolete
Programmable Type	In-System Reprogrammable™ (ISR™) CMOS
Delay Time tpd(1) Max	15 ns
Voltage Supply - Internal	4.5V ~ 5.5V
Number of Logic Elements/Blocks	-
Number of Macrocells	256
Number of Gates	-
Number of I/O	133
Operating Temperature	-40°C ~ 85°C (TA)
Mounting Type	Surface Mount
Package / Case	160-LQFP
Supplier Device Package	160-TQFP (24x24)
Purchase URL	https://www.e-xfl.com/product-detail/infineon-technologies/cy37256p160-83axi

Logic Block Diagrams (continued)
CY37128/CY37128V

CY37192/CY37192V


5.0V Device Characteristics

Maximum Ratings

(Above which the useful life may be impaired. For user guidelines, not tested.)

Storage Temperature -65°C to +150°C

Ambient Temperature with

Power Applied -55°C to +125°C

Supply Voltage to Ground Potential -0.5V to +7.0V

DC Voltage Applied to Outputs

in High-Z State -0.5V to +7.0V

DC Input Voltage -0.5V to +7.0V

DC Program Voltage 4.5 to 5.5V

Current into Outputs 16 mA

Static Discharge Voltage > 2001V
(per MIL-STD-883, Method 3015)

Latch-up Current > 200 mA

Operating Range^[2]

Range	Ambient Temperature ^[2]	Junction Temperature	Output Condition	V _{CC}	V _{CCO}
Commercial	0°C to +70°C	0°C to +90°C	5V	5V ± 0.25V	5V ± 0.25V
			3.3V	5V ± 0.25V	3.3V ± 0.3V
Industrial	-40°C to +85°C	-40°C to +105°C	5V	5V ± 0.5V	5V ± 0.5V
			3.3V	5V ± 0.5V	3.3V ± 0.3V
Military ^[3]	-55°C to +125°C	-55°C to +130°C	5V	5V ± 0.5V	5V ± 0.5V
			3.3V	5V ± 0.5V	3.3V ± 0.3V

5.0V Device Electrical Characteristics Over the Operating Range

Parameter	Description	Test Conditions	Min.	Typ.	Max.	Unit
V _{OH}	Output HIGH Voltage	V _{CC} = Min. I _{OH} = -3.2 mA (Com'I/Ind) ^[4] I _{OH} = -2.0 mA (Mil) ^[4]	2.4 2.4			V
V _{OHZ}	Output HIGH Voltage with Output Disabled ^[5]	V _{CC} = Max. I _{OH} = 0 μA (Com'I) ^[6] I _{OH} = 0 μA (Ind/Mil) ^[6] I _{OH} = -100 μA (Com'I) ^[6] I _{OH} = -150 μA (Ind/Mil) ^[6]			4.2 4.5 3.6 3.6	V
V _{OL}	Output LOW Voltage	V _{CC} = Min. I _{OL} = 16 mA (Com'I/Ind) ^[4] I _{OL} = 12 mA (Mil) ^[4]			0.5 0.5	V
V _{IH}	Input HIGH Voltage	Guaranteed Input Logical HIGH Voltage for all Inputs ^[7]	2.0		V _{CCmax}	V
V _{IL}	Input LOW Voltage	Guaranteed Input Logical LOW Voltage for all Inputs ^[7]	-0.5		0.8	V
I _{IX}	Input Load Current	V _I = GND OR V _{CC} , Bus-Hold Disabled	-10		10	μA
I _{OZ}	Output Leakage Current	V _O = GND or V _{CC} , Output Disabled, Bus-Hold Disabled	-50		50	μA
I _{OS}	Output Short Circuit Current ^[5, 8]	V _{CC} = Max., V _{OUT} = 0.5V	-30		-160	mA
I _{BHL}	Input Bus-Hold LOW Sustaining Current	V _{CC} = Min., V _{IL} = 0.8V	+75			μA
I _{BHH}	Input Bus-Hold HIGH Sustaining Current	V _{CC} = Min., V _{IH} = 2.0V	-75			μA
I _{BHLO}	Input Bus-Hold LOW Overdrive Current	V _{CC} = Max.			+500	μA
I _{BHHO}	Input Bus-Hold HIGH Overdrive Current	V _{CC} = Max.			-500	μA

Notes:

- Normal Programming Conditions apply across Ambient Temperature Range for specified programming methods. For more information on programming the Ultra37000 Family devices, please refer to the Application Note titled "An Introduction to In System Reprogramming with the Ultra37000."
- T_A is the "Instant On" case temperature.
- I_{OH} = -2 mA, I_{OL} = 2 mA for TDO.
- Tested initially and after any design or process changes that may affect these parameters.
- When the I/O is output disabled, the bus-hold circuit can weakly pull the I/O to above 3.6V if no leakage current is allowed. Note that all I/Os are output disabled during ISR programming. Refer to the application note "Understanding Bus-Hold" for additional information.
- These are absolute values with respect to device ground. All overshoots due to system or tester noise are included.
- Not more than one output should be tested at a time. Duration of the short circuit should not exceed 1 second. V_{OUT} = 0.5V has been chosen to avoid test problems caused by tester ground degradation.

Switching Characteristics Over the Operating Range ^[12]

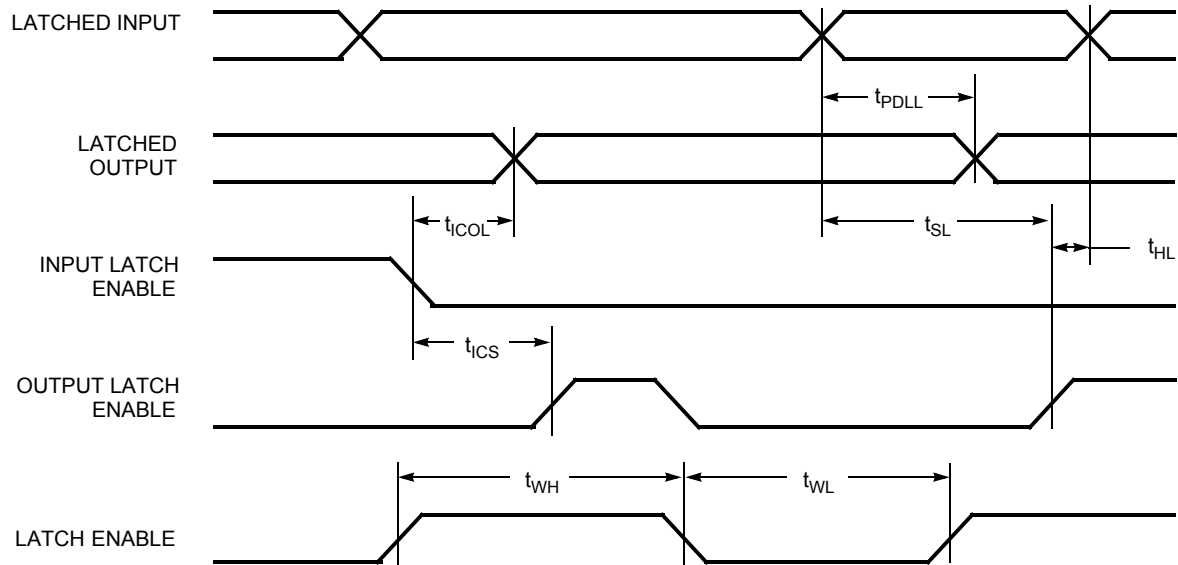
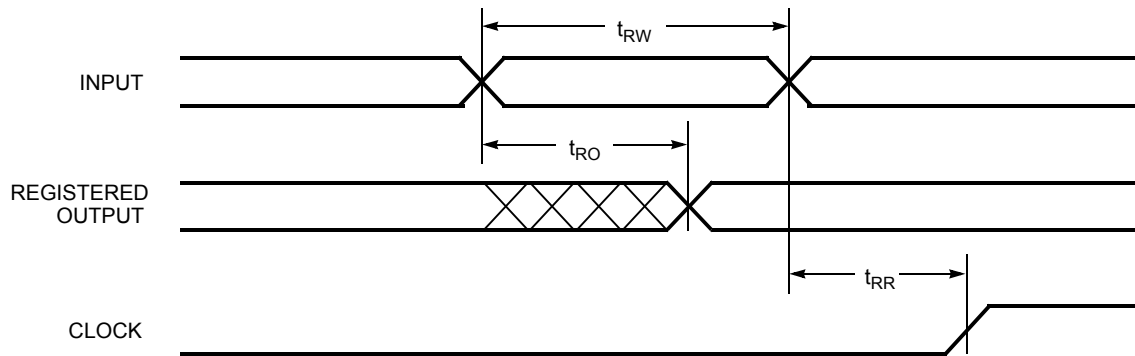
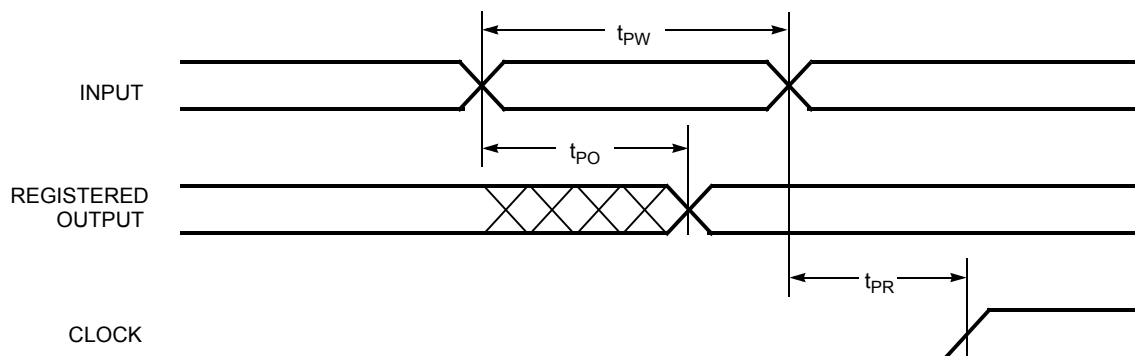
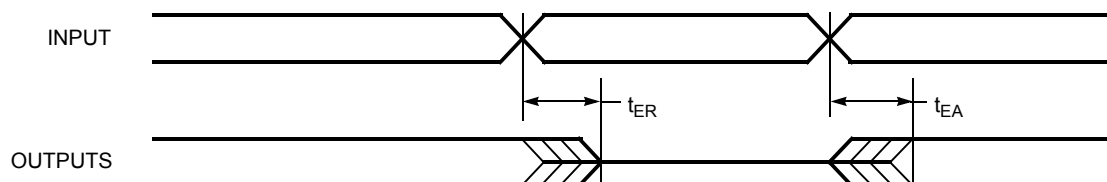
Parameter	200 MHz		167 MHz		154 MHz		143 MHz		125 MHz		100 MHz		83 MHz		66 MHz		Unit
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
Combinatorial Mode Parameters																	
t _{PD} ^[13, 14, 15]		6		6.5		7.5		8.5		10		12		15		20	ns
t _{PDL} ^[13, 14, 15]		11		12.5		14.5		16		16.5		17		19		22	ns
t _{PDLL} ^[13, 14, 15]		12		13.5		15.5		17		17.5		18		20		24	ns
t _{EA} ^[13, 14, 15]		8		8.5		11		13		14		16		19		24	ns
t _{ER} ^[11, 13]		8		8.5		11		13		14		16		19		24	ns
Input Register Parameters																	
t _{WL}	2.5		2.5		2.5		2.5		3		3		4		5		ns
t _{WH}	2.5		2.5		2.5		2.5		3		3		4		5		ns
t _{IS}	2		2		2		2		2		2.5		3		4		ns
t _{IH}	2		2		2		2		2		2.5		3		4		ns
t _{ICO} ^[13, 14, 15]		11		11		11		12.5		12.5		16		19		24	ns
t _{ICOL} ^[13, 14, 15]		12		12		12		14		16		18		21		26	ns
Synchronous Clocking Parameters																	
t _{CO} ^[14, 15]		4		4		4.5		6		6.5 ^[16]		6.5 ^[17]		8 ^[18]		10	ns
t _S ^[13]	4		4		5		5		5.5 ^[16]		6 ^[17]		8 ^[18]		10		ns
t _H	0		0		0		0		0		0		0		0		ns
t _{CO2} ^[13, 14, 15]		9.5		10		11		12		14		16		19		24	ns
t _{SCS} ^[13]	5		6		6.5		7		8 ^[16]		10		12		15		ns
t _{SL} ^[13]	7.5		7.5		8.5		9		10		12		15		15		ns
t _{HL}	0		0		0		0		0		0		0		0		ns
Product Term Clocking Parameters																	
t _{COPT} ^[13, 14, 15]		7		10		10		13		13		13		15		20	ns
t _{SPT}	2.5		2.5		2.5		3		5		5.5		6		7		ns
t _{HPT}	2.5		2.5		2.5		3		5		5.5		6		7		ns
t _{ISPT} ^[13]	0		0		0		0		0		0		0		0		ns
t _{IHPT}	6		6.5		6.5		7.5		9		11		14		19		ns
t _{CO2PT} ^[13, 14, 15]		12		14		15		19		19		21		24		30	ns
Pipelined Mode Parameters																	
t _{ICS} ^[13]	5		6		6		7		8 ^[16]		10		12		15		ns
Operating Frequency Parameters																	
f _{MAX1}	200		167		154		143		125 ^[16]		100		83		66		MHz
f _{MAX2}	200		200		200		167		154		153 ^[17]		125 ^[18]		100		MHz
f _{MAX3}	125		125		105		91		83		80 ^[17]		62.5		50		MHz
f _{MAX4}	167		167		154		125		118		100		83		66		MHz
Reset/Preset Parameters																	
t _{RW}	8		8		8		8		10		12		15		20		ns
t _{RR} ^[13]	10		10		10		10		12		14		17		22		ns

Notes:

16. The following values correspond to the CY37512 and CY37384 devices: $t_{CO} = 5$ ns, $t_S = 6.5$ ns, $t_{SCS} = 8.5$ ns, $t_{ICS} = 8.5$ ns, $f_{MAX1} = 118$ MHz.

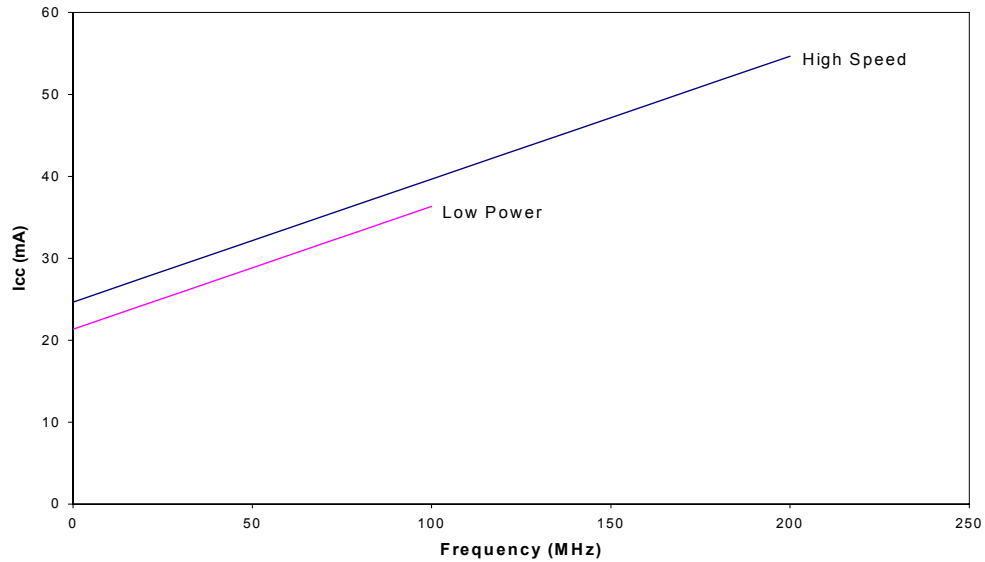
17. The following values correspond to the CY37192V and CY37256V devices: $t_{CO} = 6$ ns, $t_S = 7$ ns, $f_{MAX2} = 143$ MHz, $f_{MAX3} = 77$ MHz, and $f_{MAX4} = 100$ MHz; and for the CY37512 devices: $t_S = 7$ ns.

18. The following values correspond to the CY37512V and CY37384V devices: $t_{CO} = 6.5$ ns, $t_S = 9.5$ ns, and $f_{MAX2} = 105$ MHz.

Switching Waveforms (continued)
Latched Input and Output

Asynchronous Reset

Asynchronous Preset

Output Enable/Disable


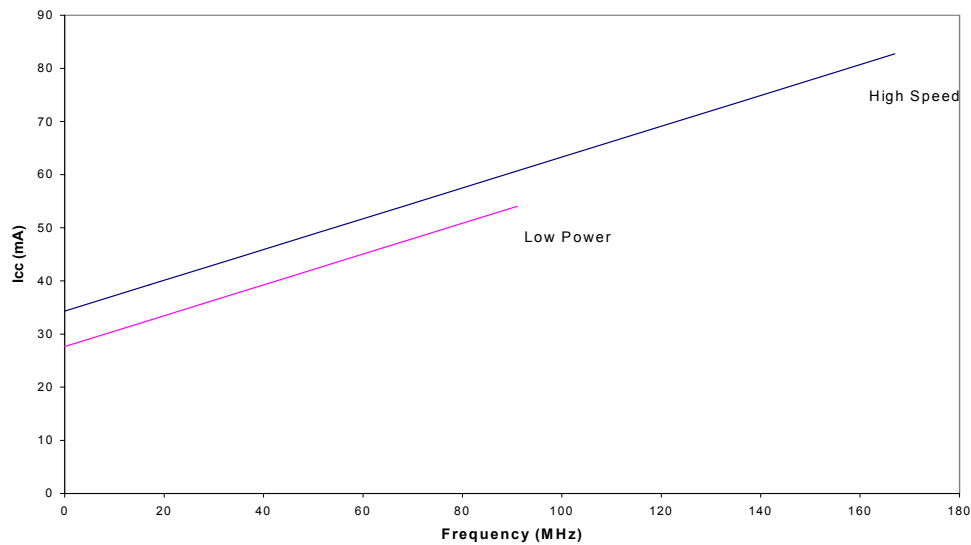
Power Consumption

Typical 5.0V Power Consumption CY37032

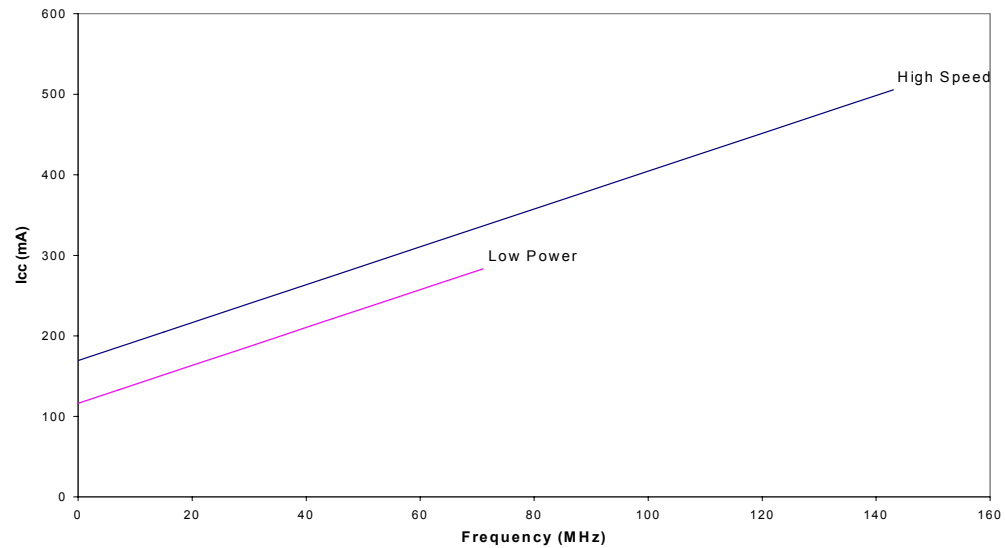


The typical pattern is a 16-bit up counter, per logic block, with outputs disabled.
V_{CC} = 5.0V, T_A = Room Temperature

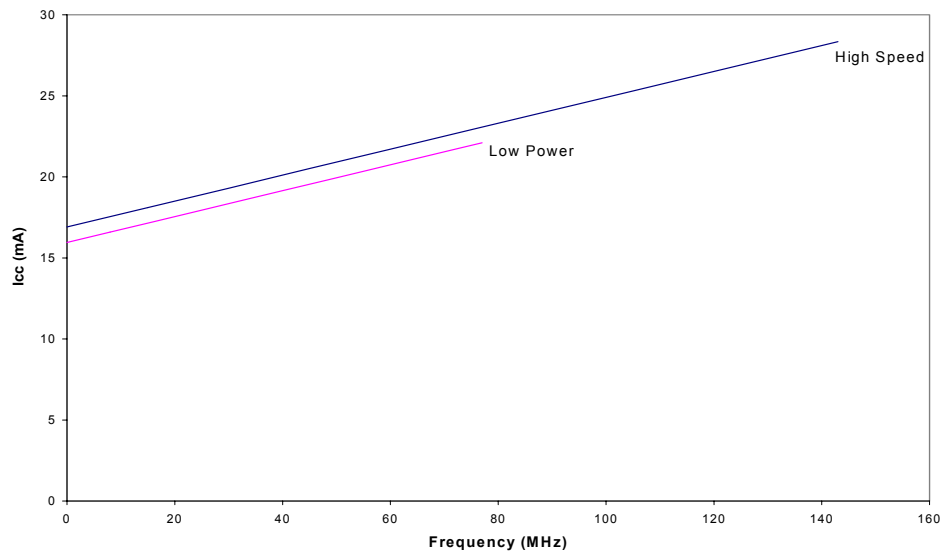
CY37064



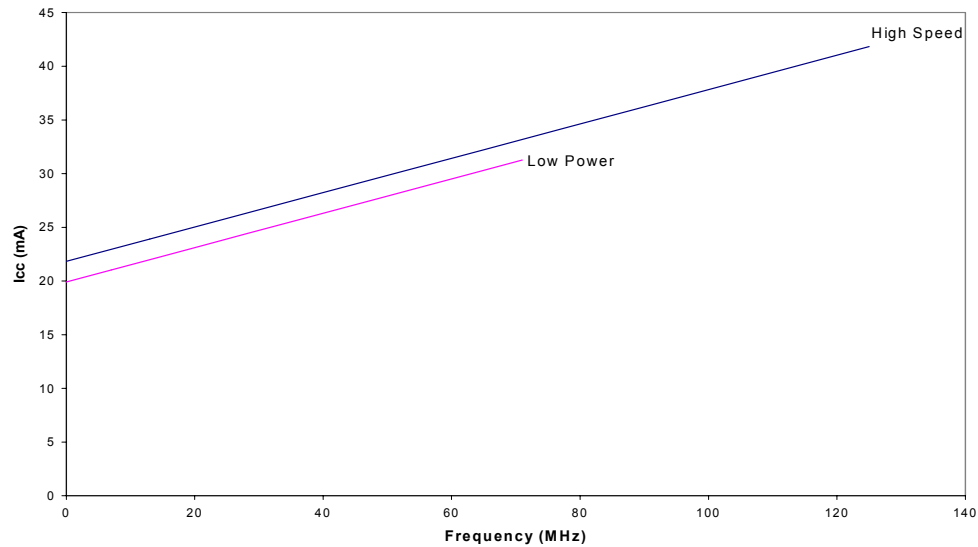
The typical pattern is a 16-bit up counter, per logic block, with outputs disabled.
V_{CC} = 5.0V, T_A = Room Temperature

Typical 5.0V Power Consumption (continued)
CY37512


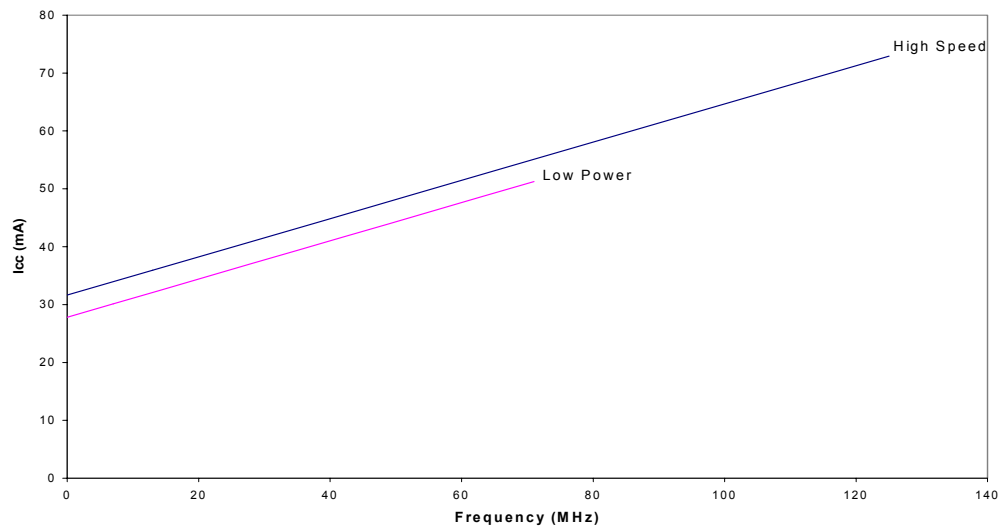
The typical pattern is a 16-bit up counter, per logic block, with outputs disabled.
 $V_{CC} = 5.0V$, $T_A = \text{Room Temperature}$

Typical 3.3V Power Consumption
CY37032V


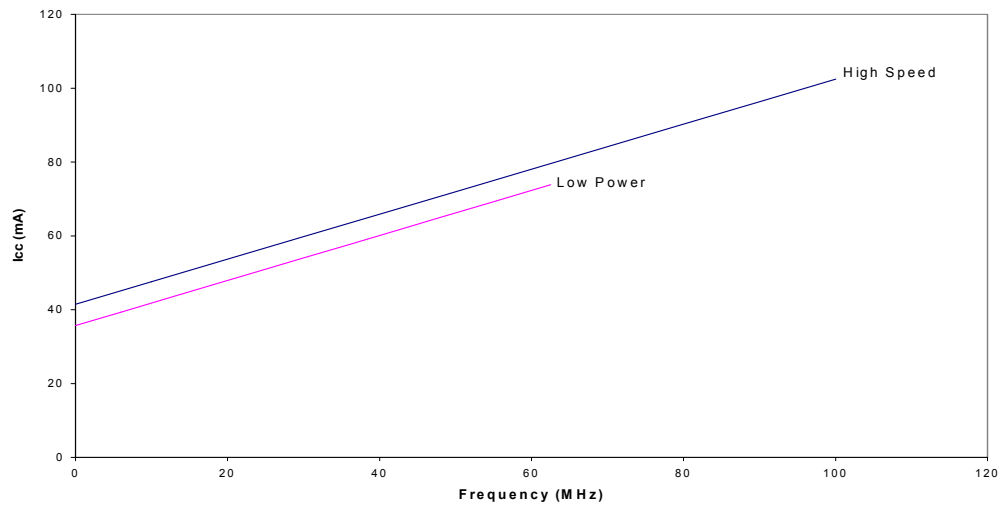
The typical pattern is a 16-bit up counter, per logic block, with outputs disabled.
 $V_{CC} = 3.3V$, $T_A = \text{Room Temperature}$

Typical 3.3V Power Consumption (continued)
CY37064V


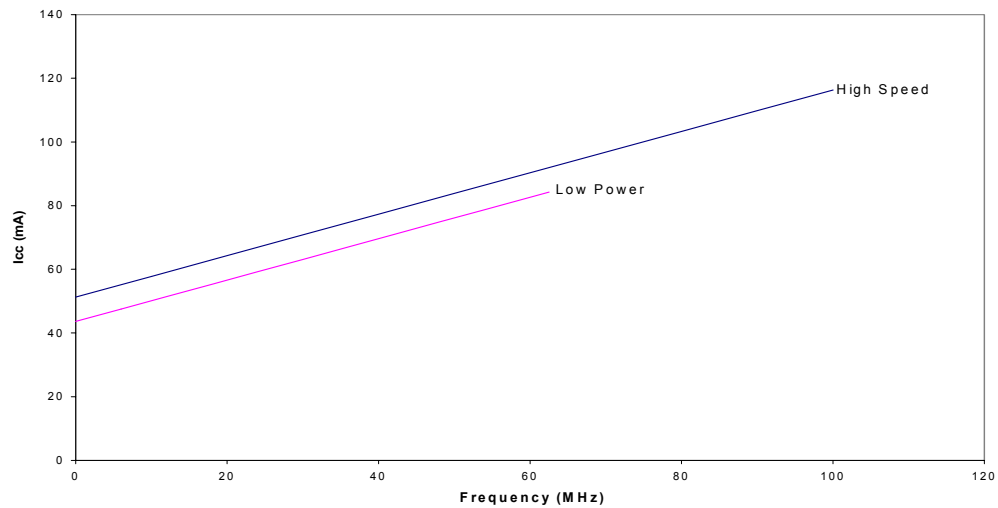
The typical pattern is a 16-bit up counter, per logic block, with outputs disabled.
 $V_{CC} = 3.3V$, $T_A = \text{Room Temperature}$

CY37128V


The typical pattern is a 16-bit up counter, per logic block, with outputs disabled.
 $V_{CC} = 3.3V$, $T_A = \text{Room Temperature}$

Typical 3.3V Power Consumption (continued)
CY37192V


The typical pattern is a 16-bit up counter, per logic block, with outputs disabled.
 $V_{CC} = 3.3V$, $T_A = \text{Room Temperature}$

CY37256V


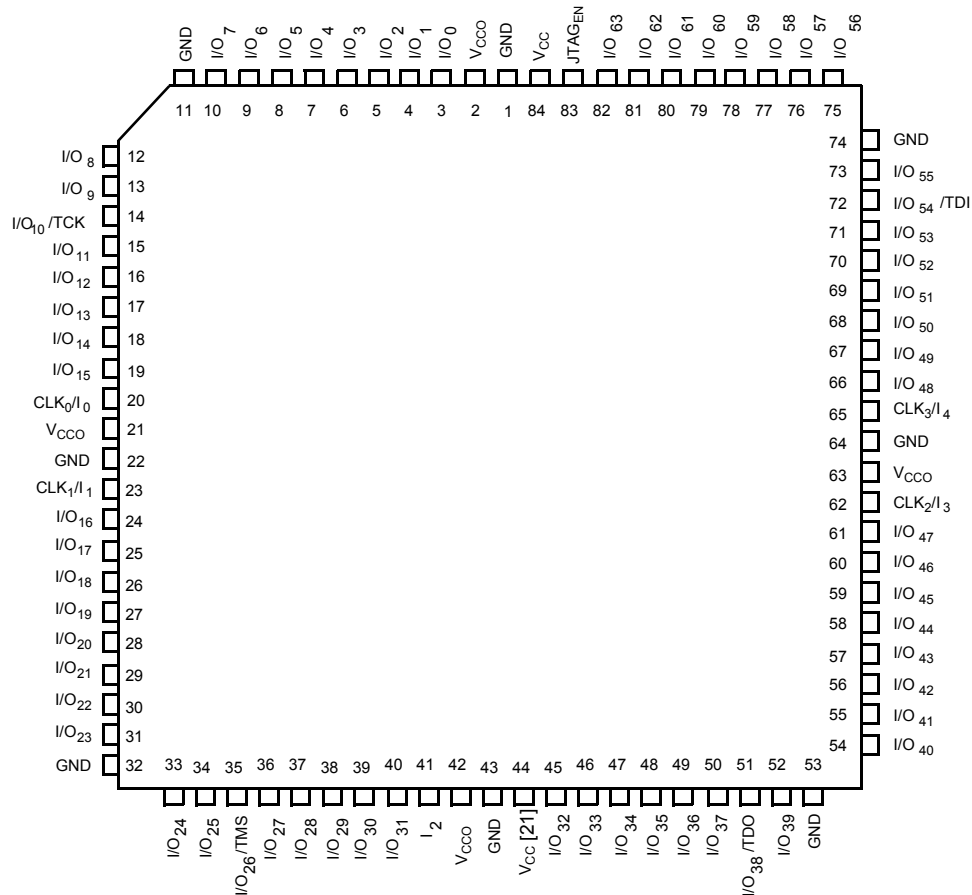
The typical pattern is a 16-bit up counter, per logic block, with outputs disabled.
 $V_{CC} = 3.3V$, $T_A = \text{Room Temperature}$

Pin Configurations^[20] (continued)
48-ball Fine-Pitch BGA (BA50)
Top View

	1	2	3	4	5	6	7	8
A	I/O ₅ TCK	V _{CC}	I/O ₃	I/O ₁	I/O ₃₁	I/O ₃₀	V _{CC}	I/O ₂₇ TDI
B	V _{CC}	I/O ₄	I/O ₂	I/O ₀	I/O ₂₉	I/O ₂₈	I/O ₂₆	CLK ₁ /I ₄
C	CLK ₂ /I ₀	I/O ₇	I/O ₆	GND	GND	I/O ₂₅	I/O ₂₄	I ₃
D	JTAG _{EN}	I/O ₈	I/O ₉	GND	GND	I/O ₂₂	I/O ₂₃	CLK ₃ /I ₂
E	CLK ₀ /I ₁	I/O ₁₂	I/O ₁₁	I/O ₁₀	I/O ₁₆	I/O ₂₀	I/O ₂₁	V _{CC}
F	I/O ₁₃ TMS	V _{CC}	I/O ₁₄	I/O ₁₅	I/O ₁₇	I/O ₁₈	V _{CC}	I/O ₁₉ TDO

Note:

20. For 3.3V versions (Ultra37000V), V_{CCO} = V_{CC}.

84-lead PLCC (J83) / CLCC (Y84)
Top View

Note:

21. This pin is a N/C, but Cypress recommends that you connect it to V_{CC} to ensure future compatibility.

Pin Configurations^[20] (continued)
256-Ball Fine-Pitch BGA (BB256)
Top View

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
A	GND	GND	I/O ₂₆	I/O ₂₄	I/O ₂₀	V _{CC}	I/O ₁₁	GND	GND	I/O ₁₈₆	V _{CC}	I/O ₁₇₇	I/O ₁₇₂	I/O ₁₆₇	GND	GND
B	GND	I/O ₂₇	I/O ₂₅	I/O ₂₃	I/O ₁₉	I/O ₁₅	I/O ₁₀	GND	GND	I/O ₁₈₅	I/O ₁₈₁	I/O ₁₇₆	I/O ₁₇₁	I/O ₁₆₆	I/O ₁₆₅	GND
C	I/O ₂₉	I/O ₂₈	NC	I/O ₂₂	I/O ₁₈	I/O ₁₄	I/O ₉	I/O ₄	I/O ₁₉₁	I/O ₁₈₄	I/O ₁₈₀	I/O ₁₇₅	I/O ₁₇₀	NC	I/O ₁₆₃	I/O ₁₆₄
D	I/O ₃₂	I/O ₃₁	I/O ₃₀	NC	I/O ₁₇	I/O ₁₃	I/O ₈	I/O ₃	I/O ₁₉₀	I/O ₁₈₃	I/O ₁₇₉	I/O ₁₇₄	I/O ₁₆₉	I/O ₁₆₀	I/O ₁₆₁	I/O ₁₆₂
E	I/O ₃₅	I/O ₃₄	I/O ₃₃	I/O ₂₁	I/O ₁₆	I/O ₁₂	I/O ₇	I/O ₂	I/O ₁₈₉	V _{CC}	I/O ₁₇₈	I/O ₁₇₃	I/O ₁₆₈	I/O ₁₅₇	I/O ₁₅₈	I/O ₁₅₉
F	V _{CC}	I/O ₃₈	I/O ₃₇	I/O ₃₆	TCK	V _{CC}	I/O ₆	I/O ₁	I/O ₁₈₈	I/O ₁₈₂	V _{CC}	TDI	I/O ₁₅₄	I/O ₁₅₅	I/O ₁₅₆	V _{CC}
G	I/O ₄₃	I/O ₄₂	I/O ₄₁	I/O ₄₀	V _{CC}	I/O ₃₉	I/O ₅	I/O ₀	I/O ₁₈₇	I/O ₁₄₈	I/O ₁₄₉	CLK ₃ /I ₄	I/O ₁₅₀	I/O ₁₅₁	I/O ₁₅₂	I/O ₁₅₃
H	GND	GND	I/O ₄₇	I/O ₄₆	CLK ₀ /I ₀	I/O ₄₅	I/O ₄₄	GND	GND	I/O ₁₄₄	I/O ₁₄₅	CLK ₂ /I ₃	I/O ₁₄₆	I/O ₁₄₇	GND	GND
J	GND	GND	I/O ₅₁	I/O ₅₀	NC	I/O ₄₉	I/O ₄₈	GND	GND	I/O ₁₄₀	I/O ₁₄₁	I ₂	I/O ₁₄₂	I/O ₁₄₃	GND	GND
K	I/O ₅₇	I/O ₅₆	I/O ₅₅	I/O ₅₄	CLK ₁ /I ₁	I/O ₅₃	I/O ₅₂	I/O ₉₁	I/O ₉₆	I/O ₁₀₁	I/O ₁₃₅	V _{CC}	I/O ₁₃₆	I/O ₁₃₇	I/O ₁₃₈	I/O ₁₃₉
L	V _{CC}	I/O ₆₀	I/O ₅₉	I/O ₅₈	TMS	V _{CC}	I/O ₈₆	I/O ₉₂	I/O ₉₇	I/O ₁₀₂	V _{CC}	TDO	I/O ₁₃₂	I/O ₁₃₃	I/O ₁₃₄	V _{CC}
M	I/O ₆₃	I/O ₆₂	I/O ₆₁	I/O ₇₂	I/O ₇₇	I/O ₈₂	V _{CC}	I/O ₉₃	I/O ₉₈	I/O ₁₀₃	I/O ₁₀₈	I/O ₁₁₂	I/O ₁₁₇	I/O ₁₂₉	I/O ₁₃₀	I/O ₁₃₁
N	I/O ₆₆	I/O ₆₅	I/O ₆₄	I/O ₇₃	I/O ₇₈	I/O ₈₃	I/O ₈₇	I/O ₉₄	I/O ₉₉	I/O ₁₀₄	I/O ₁₀₉	I/O ₁₁₃	NC	I/O ₁₂₆	I/O ₁₂₇	I/O ₁₂₈
P	I/O ₆₈	I/O ₆₇	NC	I/O ₇₄	I/O ₇₉	I/O ₈₄	I/O ₈₈	I/O ₉₅	I/O ₁₀₀	I/O ₁₀₅	I/O ₁₁₀	I/O ₁₁₄	I/O ₁₁₈	NC	I/O ₁₂₄	I/O ₁₂₅
R	GND	I/O ₆₉	I/O ₇₀	I/O ₇₅	I/O ₈₀	I/O ₈₅	I/O ₈₉	GND	GND	I/O ₁₀₆	I/O ₁₁₁	I/O ₁₁₅	I/O ₁₁₉	I/O ₁₂₁	I/O ₁₂₃	GND
T	GND	GND	I/O ₇₁	I/O ₇₆	I/O ₈₁	V _{CC}	I/O ₉₀	GND	GND	I/O ₁₀₇	V _{CC}	I/O ₁₁₆	I/O ₁₂₀	I/O ₁₂₂	GND	GND



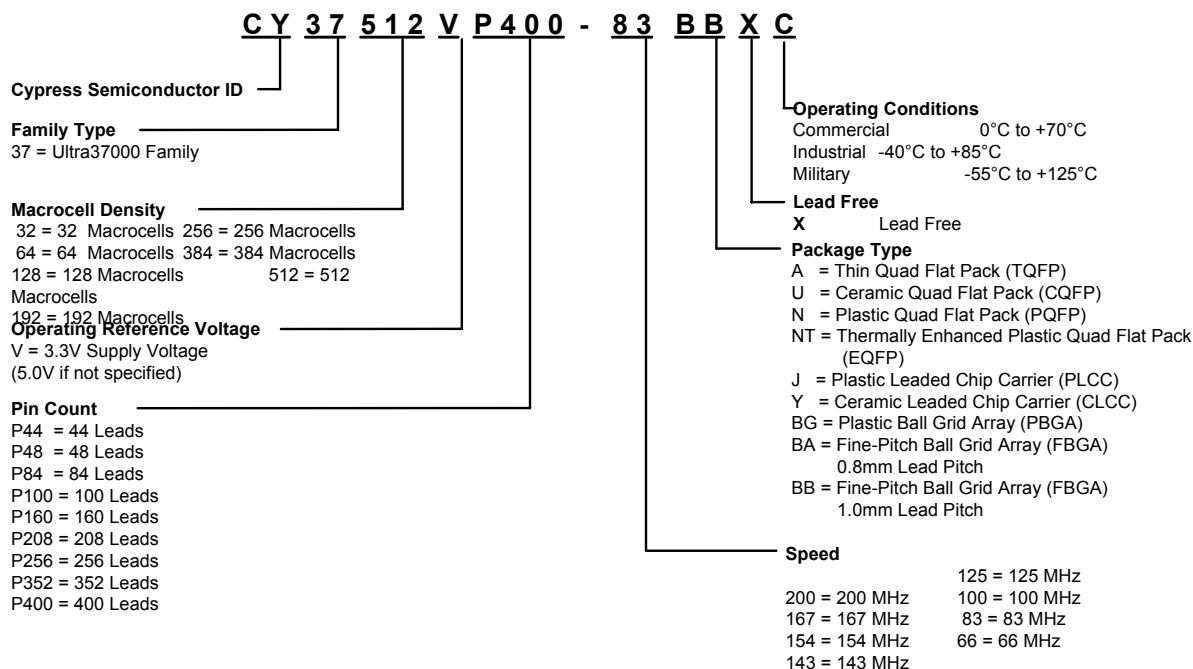
Pin Configurations^[20] (continued)

400-Ball Fine-Pitch BGA (BB400)

Top View

A	GND	GND	NC	I/O ₁₇	I/O ₁₆	I/O ₁₄	I/O ₂₉	V _{CC}	I/O ₁₁	GND	GND	I/O ₂₅₇	V _{CC}	I/O ₂₃₉	I/O ₂₃₃	I/O ₂₃₂	I/O ₂₃₀	NC	GND	GND
B	GND	GND	GND	NC	I/O ₁₅	I/O ₁₃	I/O ₂₈	V _{CC}	I/O ₁₀	GND	GND	I/O ₂₅₆	V _{CC}	I/O ₂₃₈	I/O ₂₃₁	I/O ₂₂₉	NC	GND	GND	GND
C	NC	GND	GND	GND	I/O ₂₀	I/O ₁₂	I/O ₂₇	V _{CC}	I/O ₉	GND	GND	I/O ₂₅₅	V _{CC}	I/O ₂₃₇	I/O ₂₂₈	I/O ₂₄₅	GND	GND	GND	NC
D	I/O ₄₄	NC	GND	I/O ₂₁	I/O ₁₉	I/O ₁₈	I/O ₂₆	I/O ₂₅	I/O ₈	GND	GND	I/O ₂₅₄	I/O ₂₃₅	I/O ₂₃₆	I/O ₂₅₁	I/O ₂₄₄	I/O ₂₄₃	GND	NC	I/O ₂₂₇
E	I/O ₄₆	I/O ₄₃	I/O ₂₃	I/O ₂₂	NC	I/O ₃₅	I/O ₃₄	I/O ₂₄	I/O ₇	I/O ₄	I/O ₂₆₃	I/O ₂₅₃	I/O ₂₃₄	I/O ₂₅₀	I/O ₂₄₈	NC	I/O ₂₄₁	I/O ₂₄₂	I/O ₂₂₅	I/O ₂₂₆
F	I/O ₄₇	I/O ₄₅	I/O ₄₂	I/O ₄₁	I/O ₄₀	NC	I/O ₃₃	I/O ₃₂	I/O ₆	I/O ₃	I/O ₂₆₂	I/O ₂₅₂	I/O ₂₄₉	I/O ₂₄₇	I/O ₂₂₀	I/O ₂₂₁	I/O ₂₄₀	I/O ₂₂₂	I/O ₂₂₃	I/O ₂₂₄
G	I/O ₅₃	I/O ₅₂	I/O ₅₁	I/O ₅₀	I/O ₃₉	I/O ₃₈	I/O ₃₇	I/O ₃₁	I/O ₅	I/O ₂	I/O ₂₆₁	V _{CC}	I/O ₂₄₆	I/O ₂₁₇	I/O ₂₁₈	I/O ₂₁₉	I/O ₂₁₂	I/O ₂₁₃	I/O ₂₁₄	I/O ₂₁₅
H	V _{CC}	V _{CC}	V _{CC}	I/O ₄₉	I/O ₄₈	I/O ₃₆	TCK	V _{CC}	I/O ₃₀	I/O ₁	I/O ₂₅₉	I/O ₂₆₀	V _{CC}	TDI	I/O ₂₁₆	I/O ₂₁₀	I/O ₂₁₁	V _{CC}	V _{CC}	V _{CC}
J	I/O ₅₉	I/O ₅₈	I/O ₅₇	I/O ₅₆	I/O ₅₅	I/O ₅₄	V _{CC}	I/O ₆₂	I/O ₆₀	I/O ₀	I/O ₂₅₈	I/O ₂₀₂	I/O ₂₀₃	CLK ₃ /I ₄	I/O ₂₀₄	I/O ₂₀₅	I/O ₂₀₆	I/O ₂₀₇	I/O ₂₀₈	I/O ₂₀₉
K	GND	GND	GND	GND	I/O ₆₅	I/O ₆₄	CLK ₀ /I ₀	I/O ₆₃	I/O ₆₁	GND	GND	I/O ₁₉₈	I/O ₁₉₉	CLK ₂ /I ₃	I/O ₂₀₀	I/O ₂₀₁	GND	GND	GND	GND
L	GND	GND	GND	GND	I/O ₆₉	I/O ₆₈	NC	I/O ₆₇	I/O ₆₆	GND	GND	I/O ₁₉₃	I/O ₁₉₅	I ₂	I/O ₁₉₆	I/O ₁₉₇	GND	GND	GND	GND
M	I/O ₈₉	I/O ₈₈	I/O ₈₇	I/O ₈₆	I/O ₈₅	I/O ₈₄	CLK ₁ /I ₁	I/O ₇₁	I/O ₇₀	I/O ₁₂₆	I/O ₁₃₂	I/O ₁₉₂	I/O ₁₉₄	V _{CC}	I/O ₁₇₄	I/O ₁₇₅	I/O ₁₇₆	I/O ₁₇₇	I/O ₁₇₈	I/O ₁₇₉
N	V _{CC}	V _{CC}	V _{CC}	I/O ₉₁	I/O ₉₀	I/O ₇₂	TMS	V _{CC}	I/O ₁₂₈	I/O ₁₂₇	I/O ₁₃₃	I/O ₁₆₂	V _{CC}	TDO	I/O ₁₈₀	I/O ₁₆₈	I/O ₁₆₉	V _{CC}	V _{CC}	V _{CC}
P	I/O ₉₅	I/O ₉₄	I/O ₉₃	I/O ₉₂	I/O ₇₅	I/O ₇₄	I/O ₇₃	I/O ₁₁₄	V _{CC}	I/O ₁₂₉	I/O ₁₃₄	I/O ₁₃₇	I/O ₁₆₃	I/O ₁₈₁	I/O ₁₈₂	I/O ₁₈₃	I/O ₁₇₀	I/O ₁₇₁	I/O ₁₇₂	I/O ₁₇₃
R	I/O ₉₀	I/O ₇₉	I/O ₇₈	I/O ₁₀₈	I/O ₇₇	I/O ₇₆	I/O ₁₁₅	I/O ₁₁₇	I/O ₁₂₀	I/O ₁₃₀	I/O ₁₃₅	I/O ₁₃₈	I/O ₁₆₄	I/O ₁₆₅	NC	I/O ₁₈₄	I/O ₁₈₅	I/O ₁₈₆	I/O ₁₈₉	I/O ₁₉₁
T	I/O ₈₂	I/O ₈₁	I/O ₁₁₀	I/O ₁₀₉	NC	I/O ₁₁₆	I/O ₁₁₈	I/O ₁₀₂	I/O ₁₂₁	I/O ₁₃₁	I/O ₁₃₆	I/O ₁₃₉	I/O ₁₅₆	I/O ₁₆₆	I/O ₁₆₇	NC	I/O ₁₅₄	I/O ₁₅₅	I/O ₁₈₇	I/O ₁₉₀
U	I/O ₈₃	NC	GND	I/O ₁₁₁	I/O ₁₁₂	I/O ₁₁₉	I/O ₁₀₄	I/O ₁₀₃	I/O ₁₂₂	GND	GND	I/O ₁₄₀	I/O ₁₅₇	I/O ₁₅₈	I/O ₁₅₀	I/O ₁₅₁	I/O ₁₅₃	GND	NC	I/O ₁₈₈
V	NC	GND	GND	GND	I/O ₁₁₃	I/O ₉₆	I/O ₁₀₅	V _{CC}	I/O ₁₂₃	GND	GND	I/O ₁₄₁	V _{CC}	I/O ₁₅₉	I/O ₁₄ 4	I/O ₁₅₂	GND	GND	GND	NC
W	GND	GND	GND	NC	I/O ₉₇	I/O ₉₉	I/O ₁₀₆	V _{CC}	I/O ₁₂₄	GND	GND	I/O ₁₄₂	V _{CC}	I/O ₁₆₀	I/O ₁₄₅	I/O ₁₄₇	NC	GND	GND	GND
Y	GND	GND	NC	I/O ₉₈	I/O ₁₀₀	I/O ₁₀₁	I/O ₁₀₇	V _{CC}	I/O ₁₂₅	GND	GND	I/O ₁₄₃	V _{CC}	I/O ₁₆₁	I/O ₁₄₆	I/O ₁₄₈	I/O ₁₄₉	NC	GND	GND

Ordering Information



5.0V Ordering Information

Macrocells	Speed (MHz)	Ordering Code	Package Name	Package Type	Operating Range
32	200	CY37032P44-200AC	A44	44-Lead Thin Quad Flat Pack	Commercial
		CY37032P44-200AXC	A44	44-Lead Lead Free Thin Quad Flat Pack	
		CY37032P44-200JC	J67	44-Lead Plastic Leaded Chip Carrier	
		CY37032P44-200JXC	J67	44-Lead Lead Free Plastic Leaded Chip Carrier	
	154	CY37032P44-154AC	A44	44-Lead Thin Quad Flat Pack	Commercial
		CY37032P44-154JC	J67	44-Lead Plastic Leaded Chip Carrier	
		CY37032P44-154AI	A44	44-Lead Thin Quad Flat Pack	Industrial
		CY37032P44-154AXI	A44	44-Lead Lead Free Thin Quad Flat Pack	
		CY37032P44-154JI	J67	44-Lead Plastic Leaded Chip Carrier	
		CY37032P44-154JXI	J67	44-Lead Lead Free Plastic Leaded Chip Carrier	
	125	CY37032P44-125AC	A44	44-Lead Thin Quad Flat Pack	Commercial
		CY37032P44-125AXC	A44	44-Lead Lead Free Thin Quad Flat Pack	
		CY37032P44-125JC	J67	44-Lead Plastic Leaded Chip Carrier	
		CY37032P44-125JXC	J67	44-Lead Lead Free Plastic Leaded Chip Carrier	
		CY37032P44-125AI	A44	44-Lead Thin Quad Flat Pack	Industrial
		CY37032P44-125JI	J67	44-Lead Plastic Leaded Chip Carrier	
64	200	CY37064P44-200AC	A44	44-Lead Thin Quad Flat Pack	Commercial
		CY37064P44-200AXC	A44	44-Lead Lead Free Thin Quad Flat Pack	
		CY37064P44-200JC	J67	44-Lead Plastic Leaded Chip Carrier	
		CY37064P44-200JXC	J67	44-Lead Lead Free Plastic Leaded Chip Carrier	
		CY37064P84-200JC	J83	84-Lead Plastic Leaded Chip Carrier	
		CY37064P100-200AC	A100	100-Lead Thin Quad Flat Pack	
		CY37064P100-200AXC	A100	100-Lead Lead Free Thin Quad Flat Pack	

5.0V Ordering Information (continued)

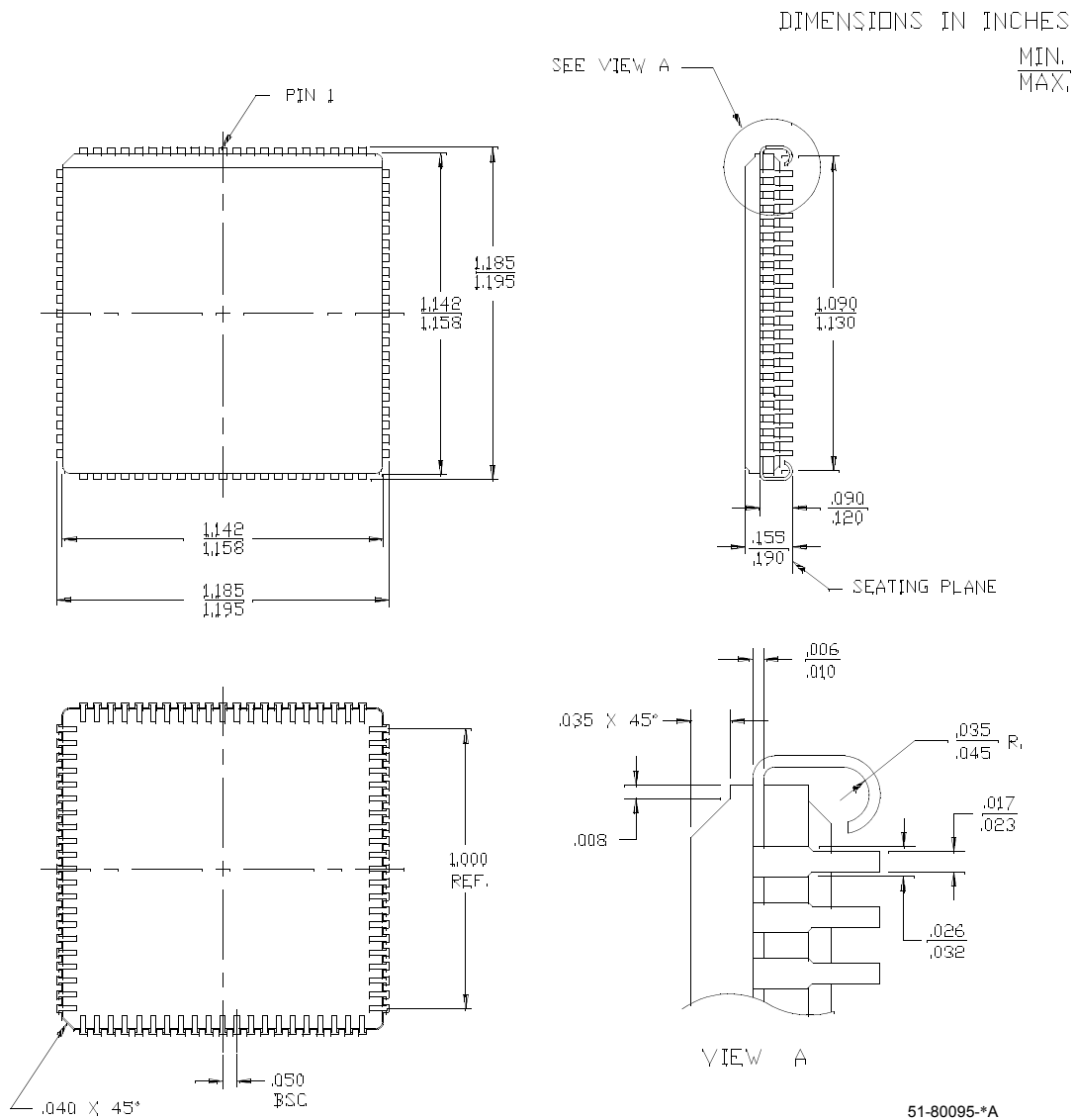
Macrocells	Speed (MHz)	Ordering Code	Package Name	Package Type	Operating Range
256	154	CY37256P160-154AC	A160	160-Lead Thin Quad Flat Pack	Commercial
		CY37256P160-154AXC	A160	160-Lead Lead Free Thin Quad Flat Pack	
		CY37256P208-154NC	N208	208-Lead Plastic Quad Flat Pack	
		CY37256P256-154BGC	BG292	292-Ball Plastic Ball Grid Array	
	125	CY37256P160-125AC	A160	160-Lead Thin Quad Flat Pack	Commercial
		CY37256P160-125AXC	A160	160-Lead Lead Free Thin Quad Flat Pack	
		CY37256P208-125NC	N208	208-Lead Plastic Quad Flat Pack	
		CY37256P256-125BGC	BG292	292-Ball Plastic Ball Grid Array	
		CY37256P160-125AI	A160	160-Lead Thin Quad Flat Pack	Industrial
		CY37256P160-125AXI	A160	160-Lead Lead Free Thin Quad Flat Pack	
		CY37256P208-125NI	N208	208-Lead Plastic Quad Flat Pack	
		CY37256P256-125BGI	BG292	292-Ball Plastic Ball Grid Array	
		5962-9952302QZC	U162	160-Lead Ceramic Quad Flat Pack	Military
	83	CY37256P160-83AC	A160	160-Lead Thin Quad Flat Pack	Commercial
		CY37256P160-83AXC	A160	160-Lead Lead Free Thin Quad Flat Pack	
		CY37256P208-83NC	N208	208-Lead Plastic Quad Flat Pack	
		CY37256P256-83BGC	BG292	292-Ball Plastic Ball Grid Array	
		CY37256P160-83AI	A160	160-Lead Thin Quad Flat Pack	Industrial
		CY37256P160-83AXI	A160	160-Lead Lead Free Thin Quad Flat Pack	
		CY37256P208-83NI	N208	208-Lead Plastic Quad Flat Pack	
		CY37256P256-83BGI	BG292	292-Ball Plastic Ball Grid Array	
		5962-9952301QZC	U162	160-Lead Ceramic Quad Flat Pack	Military
384	125	CY37384P208-125NC	N208	208-Lead Plastic Quad Flat Pack	Commercial
		CY37384P256-125BGC	BG292	292-Ball Plastic Ball Grid Array	
	83	CY37384P208-83NC	N208	208-Lead Plastic Quad Flat Pack	Commercial
		CY37384P256-83BGC	BG292	292-Ball Plastic Ball Grid Array	
		CY37384P208-83NI	N208	208-Lead Plastic Quad Flat Pack	Industrial
		CY37384P256-83BGI	BG292	292-Ball Plastic Ball Grid Array	

3.3V Ordering Information (continued)

Macrocells	Speed (MHz)	Ordering Code	Package Name	Package Type	Operating Range
256	100	CY37256VP160-100AC	A160	160-Lead Thin Quad Flat Pack	Commercial
		CY37256VP160-100AXC	A160	160-Lead Lead Free Thin Quad Flat Pack	
		CY37256VP208-100NC	N208	208-Lead Plastic Quad Flat Pack	
		CY37256VP256-100BGC	BG292	292-Ball Plastic Ball Grid Array	
		CY37256VP256-100BBC	BB256	256-Ball Fine-Pitch Ball Grid Array	
		CY37256VP160-100AI	A160	160-Lead Thin Quad Flat Pack	Industrial
		CY37256VP160-100AXI	A160	160-Lead Lead Free Thin Quad Flat Pack	
	66	CY37256VP160-66AC	A160	160-Lead Thin Quad Flat Pack	Commercial
		CY37256VP160-66AXC	A160	160-Lead Lead Free Thin Quad Flat Pack	
		CY37256VP208-66NC	N208	208-Lead Plastic Quad Flat Pack	
		CY37256VP256-66BGC	BG292	292-Ball Plastic Ball Grid Array	
		CY37256VP256-66BBC	BB256	256-Ball Fine-Pitch Ball Grid Array	
		CY37256VP160-66AI	A160	160-Lead Thin Quad Flat Pack	Industrial
		CY37256VP256-66BGI	BG292	292-Ball Plastic Ball Grid Array	
		CY37256VP256-66BBI	BB256	256-Ball Fine-Pitch Ball Grid Array	
		5962-9952401QZC	U162	160-Lead Ceramic Quad Flat Pack	Military
384	83	CY37384VP208-83NC	N208	208-Lead Plastic Quad Flat Pack	Commercial
		CY37384VP256-83BGC	BG292	292-Ball Plastic Ball Grid Array	
	66	CY37384VP208-66NC	N208	208-Lead Plastic Quad Flat Pack	Commercial
		CY37384VP256-66BGC	BG292	292-Ball Plastic Ball Grid Array	
		CY37384VP208-66NI	N208	208-Lead Plastic Quad Flat Pack	Industrial
		CY37384VP256-66BGI	BG292	292-Ball Plastic Ball Grid Array	
512	83	CY37512VP208-83NC	N208	208-Lead Plastic Quad Flat Pack	Commercial
		CY37512VP256-83BGC	BG292	292-Ball Plastic Ball Grid Array	
		CY37512VP352-83BGC	BG388	388-Ball Plastic Ball Grid Array	
		CY37512VP400-83BBC	BB400	400-Ball Fine-Pitch Ball Grid Array	
	66	CY37512VP208-66NC	N208	208-Lead Plastic Quad Flat Pack	Commercial
		CY37512VP256-66BGC	BG292	292-Ball Plastic Ball Grid Array	
		CY37512VP352-66BGC	BG388	388-Ball Plastic Ball Grid Array	
		CY37512VP400-66BBC	BB400	400-Ball Fine-Pitch Ball Grid Array	
		CY37512VP208-66NI	N208	208-Lead Plastic Quad Flat Pack	Industrial
		CY37512VP256-66BGI	BG292	292-Ball Plastic Ball Grid Array	
		CY37512VP352-66BGI	BG388	388-Ball Plastic Ball Grid Array	
		CY37512VP400-66BBI	BB400	400-Ball Fine-Pitch Ball Grid Array	
		5962-9952601QZC	U208	208-Lead Ceramic Quad Flat Pack	Military

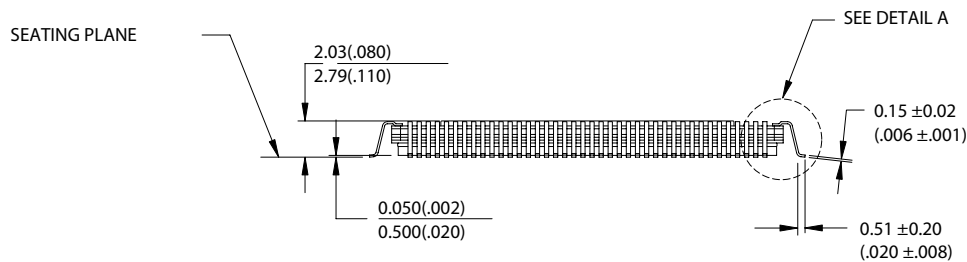
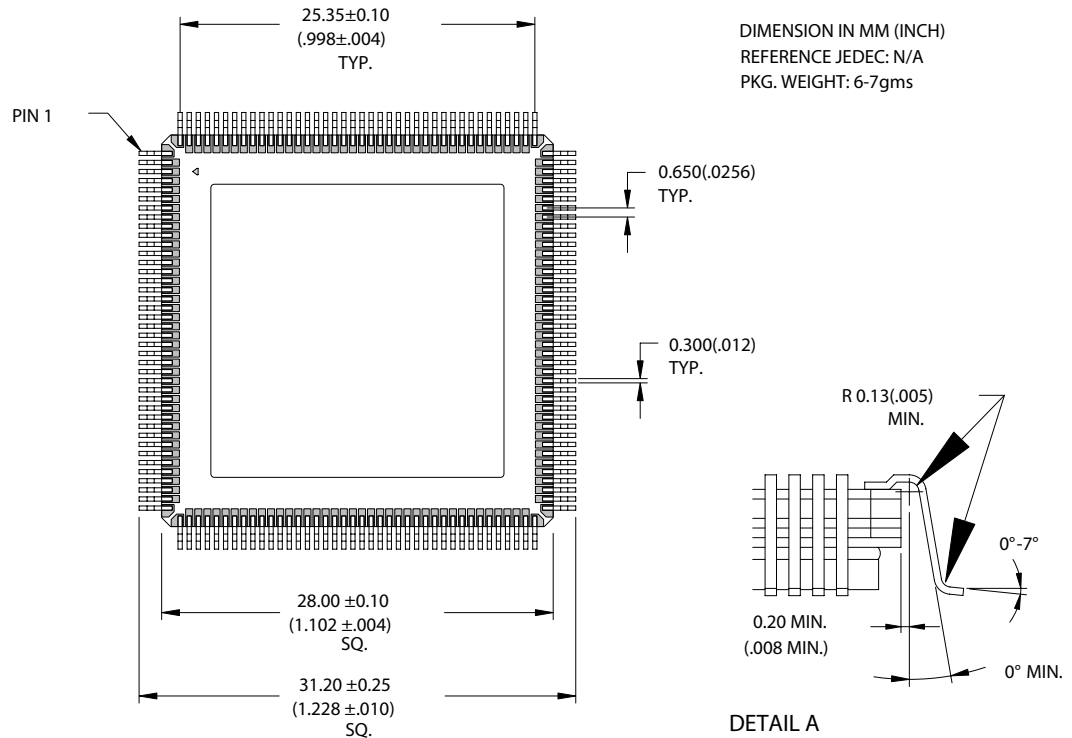
Package Diagrams (continued)

84-Lead Ceramic Leaded Chip Carrier Y84



Package Diagrams (continued)

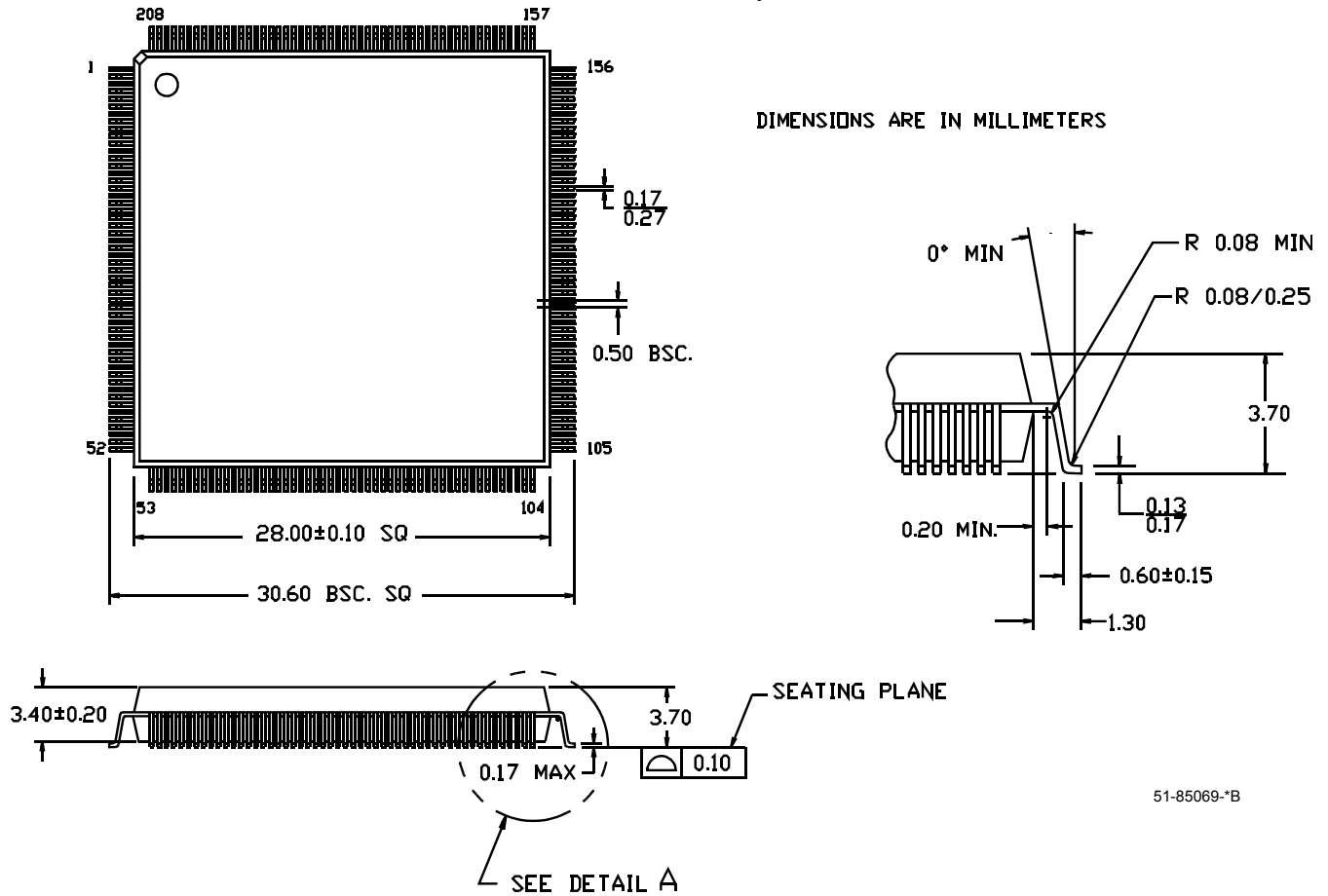
160-Lead Ceramic Quad Flatpack (Cavity Up) U162



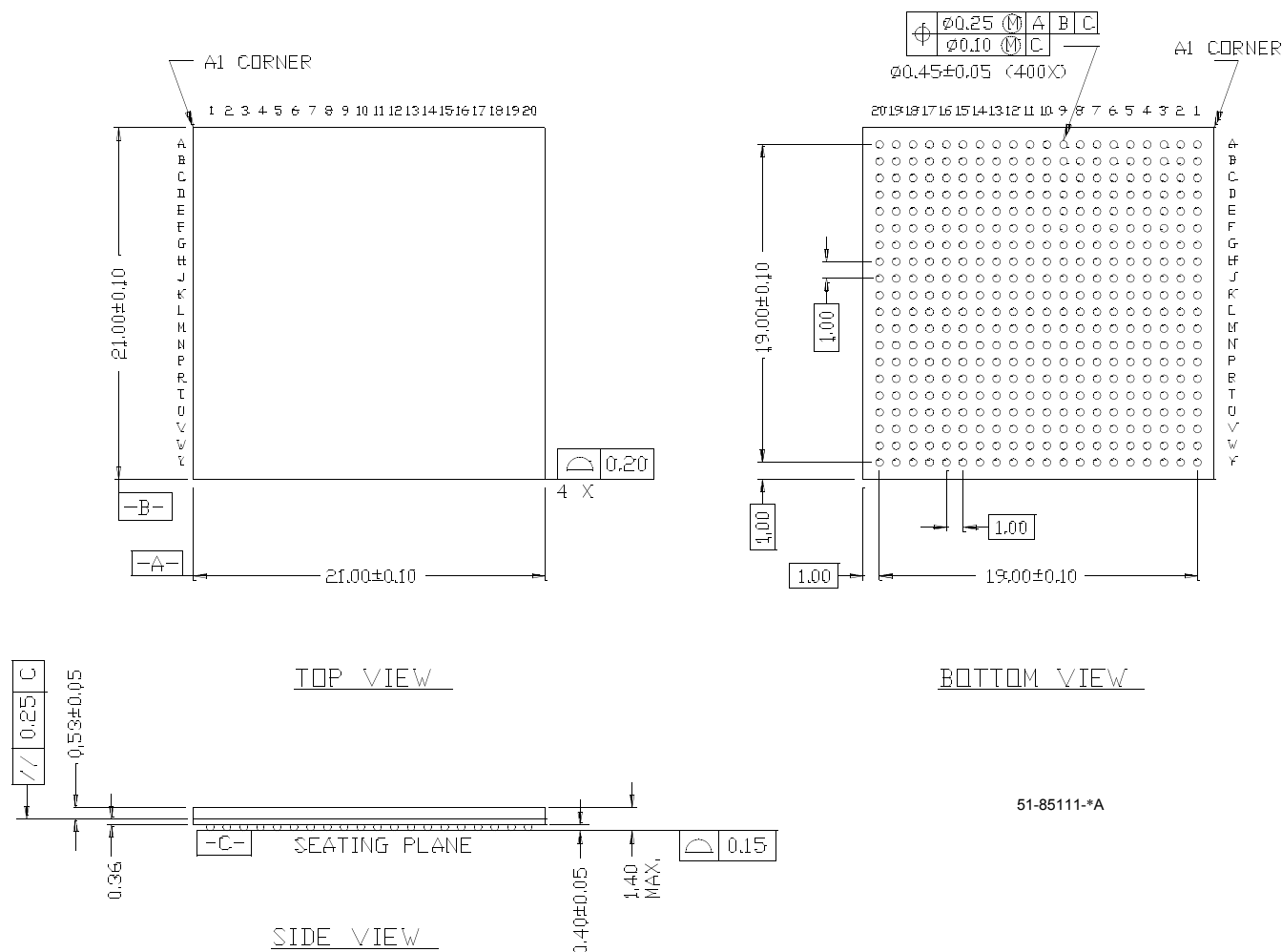
51-80106-*A

Package Diagrams (continued)

208-Lead Plastic Quad Flatpack N208



51-85069-*B

Package Diagrams (continued)
400-Ball FBGA (21 x 21 x 1.4 mm) BB400


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Addendum**3.3V Operating Range****(CY37064VP100-143AC, CY37064VP100-143BBC, CY37064VP44-143AC, CY37064VP48-143BAC)**

Range	Ambient Temperature ^[2]	Junction Temperature	V _{CC}
Commercial	0°C to +70°C	0°C to +90°C	3.3V ± 0.16V