



MOTOROLA

*Semiconductor Products Sector
Networking and Computing Systems Group
Networking and Communications System Division*

PCN: Transition to 860/855 rev D4

Effective Date: 05-Nov-00

DESCRIPTION AND PURPOSE

Motorola is pleased to announce the introduction of the 860/855T rev D4. All customers should start their transition to D4 now.

855T customers should move to D4 now.

D3 to D4 Conversion

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The rev D4 of the XPC860 is hardware and software compatible with the D3. Changes were made to internal transistor circuitry to improve speed paths thereby increasing yields on the 80 MHz parts. The 855T was introduced with rev D3 so only a transition to D4 is required.

860DT/T B3/B5 to D4 Conversion

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The XPC860DT/T rev D4 is pin-for-pin compatible with previous revisions of the 860DT/T provided that the user properly configures the parallel I/O port (port D). To properly configure port D, the user must pay careful attention to the PDDIR and PDPAR registers. To configure the 860 rev D4 to be compatible with previous revisions, for each bit set in the PDPAR register, each corresponding bit in the PDDIR register must be cleared (set to 0). If the corresponding bits in the PDDIR register are set to 1, new port D functionality in the 860 rev D4 is enabled. In this case, the 860 rev D4 may not operate identically to a previous revision. The user must also pay careful attention to the FEC_enable bit. Please consult the "Checklist for converting from pre rev D Silicon" document found on the Netcomm external web site at:
<http://www.mot.com/netcomm>.

860 C1 to D4 Conversion

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The XPC860 rev D4 is pin-for-pin compatible with the 860 rev C1 provided that the user properly configures the parallel I/O port (port D). To properly configure port D, the user must pay careful attention to the PDDIR and PDPAR registers. The user should consult "Checklist for converting from pre rev D Silicon" document found on the Netcomm external web site at:
<http://www.mot.com/netcomm>.

Schedule for 860/855T rev D4

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Samples: July 2000
Limited production: September 2000
Full production: October 2000

**For More Information On This Product,
Go to: www.freescale.com**



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The 860 Rev B3/B5/C1/D3 to D4 backlog transition will commence in July 2000 and the completion date is expected at the expiration of this PCN. Motorola's goal is to fully accommodate its customers during this transition.

860/855T rev D4 Production Fab/ Assembly/ Test sites

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Fab: MOS 11, Austin, Tx
Assy: Kuala Lumpur, Malaysia (KLM)
Test sites: Austin, TX and KLM

860/855T rev D4 Product Information

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The primary advantages of rev D4 include yields up to 80 MHz, extended temperature operation up to 66 MHz, larger dual-port ram (8KB) and errata fixes.

The 860 rev D4 series includes the 860P and 860DP, with 16K I-cache/8K D-cache, the baseline 860 family with the standard 4K I-cache/4K D-cache including the 860T and 860DT, and the 855T.

50/66/80 MHz

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Frequencies available for the 860/855T rev D4 are 50, 66 and 80 MHz.

For current customers using 33 MHz devices, a transition to the 50 MHz p/n is required. 50 MHz parts operate up to 50 MHz; thus operation at 33 MHz is no issue in a system.

The fastest frequency available for D4 is 80 MHz. All 66 and 80 MHz devices must operate in half-speed bus mode i.e. 33 MHz and 40 MHz external bus speed respectively. The fastest external bus speed is 50 MHz attained by using a 50 MHz device.

Ext temp

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Extended temperature operation up to 66 MHz is now available on the 860/855T rev D4 family. Extended temperature is defined as -40C Ta to +95C Tj.

Errata

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Rev B3/B5/C1 errata corrected in the 860 rev D4 are included in the 860 family device errata reference found at: <http://www.mot.com/netcomm>. No errata were corrected from 860/855T rev D3 to D4, just speed paths.

Part number consolidation

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rev B3/B5 rev D4
860DT ==> 860DT
860T ==> 860T

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rev C1 ==> rev D4
860DC/860DE ==> 860DE
860DH ==> 860DT
860/860EN ==> 860EN
860MH/860SR ==> 860SR

rev D3 rev D4
860DE ==> 860DE
860DT ==> 860DT
860DP ==> 860DP
860EN ==> 860EN
860SR ==> 860SR
860T ==> 860T
860P ==> 860P
855T ==> 855T

Samples

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For D4 samples, we will offer all versions via KXPC part numbers, e.g. KXPC860PZP80D4, etc ...

RAM Microcode

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For users using RAM microcode packages, please obtain RAM microcode packages for rev D4. Rev B3/B5/C1 microcode packages have been recompiled for rev D4. Please consult with your local sales office. Rev D3 microcode packages operate with no changes or recompilation necessary for rev D4.

QUALIFICATION PLAN

Qual/Characterization Status

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The 860/855T rev D4, mask set 3K20A, has met XC qualification requirements and is the planned high volume mask revision. It is manufactured in MOS11 on the 0.32um CDR2 process, and is assembled in the 357-pin PBGA (ZP) in KLM. These technologies are fully qualified.

RELIABILITY DATA SUMMARY

The D4 qualification was largely contingent on the successful qualification of D3 (issued in prior PCN).

Activity Results (#fails/#devices)
Electrical Characterization 0 / 5 **
Comparable to D.3 revision PASS

** 5 units characterized in each corner of a matrix lot

Final Test Yield PASS
Comparable to D.3 revision



Sort Yield Analysis (speed distribution) PASS
Comparable to D.3 revision

ELECTRICAL CHARACTERISTIC SUMMARY

860P D.4 & 860P D.3 Spec Comparison & Summary

CPU @ 66Mhz

Spec	Min	Avg	Max	Min	Avg	Max
sp8	9.53	10.49	11.88	9.73	10.91	11.72 (33 MHz Bus)
sp8a	7.34	7.82	8.44	7.62	8.10	8.40
sp8b	7.66	7.94	8.44	7.81	8.31	8.52
sp11	8.05	8.71	9.61	8.44	9.22	9.45
sp11a	7.78	7.84	7.85	7.64	7.83	7.85
sp12	9.02	9.47	10.78	9.11	9.65	9.99
sp12a	3.98	4.44	5.57	3.98	4.65	5.1
sp16	4.03	4.73	5.63	4.27	4.94	5.44
sp16a	3.57	4.24	5.16	3.84	4.59	4.98
sp17	0.00	0.00	0.00	0.00	0.00	0.00
sp18	3.77	4.15	4.59	3.97	4.26	4.55
sp19	0.00	0.00	0.00	0.00	0.00	0.00
sp22	8.32	8.46	9.02	8.32	8.61	9.05
sp23	2.72	3.29	3.84	2.67	3.25	3.66
sp25	3.46	4.06	4.75	3.69	4.28	4.66
sp28	2.46	3.01	3.52	2.64	3.09	3.40
sp31	3.16	3.64	4.34	3.43	3.85	4.25
sp31c	7.38	7.85	8.51	7.66	8.20	8.68
sp32	3.46	4.00	4.86	3.66	4.18	4.54
sp32b	3.46	4.05	4.81	3.63	4.22	4.75
sp32c	8.02	8.63	9.42	8.33	8.88	9.32
sp33	3.32	3.83	4.58	3.59	4.18	4.38
sp39	3.00	3.38	3.94	3.09	3.41	3.75
sp52	7.24	7.76	8.57	7.47	8.12	8.60

Serial @ 50 MHz

sp8	7.89	8.28	8.59	8.01	8.18	8.56
sp8a	7.42	7.82	8.28	7.50	7.73	8.20
sp8b	7.89	8.08	8.36	8.87	9.12	9.34
sp11	8.28	8.89	9.38	8.63	9.06	9.45
sp11a	3.98	4.42	5.74	3.88	4.57	5.14
sp12a	3.22	4.56	5.92	3.13	4.43	4.98
sp18	3.68	4.01	4.34	3.73	4.01	4.38
sp19	0.00	0.00	0.00	0.00	0.00	0.00
sp25	3.40	3.92	4.51	3.57	4.10	4.48
sp32b	3.34	3.95	4.63	3.57	4.14	4.57

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sp64	4.40	5.06	5.74	4.57	5.12	5.65
sp66	5.00	5.75	6.33	4.92	5.57	6.17

Bus @ 50 MHz

sp8	8.28	8.55	9.14	8.59	8.72	9.41
sp8a	7.50	7.82	8.13	7.73	7.86	8.05
sp8b	7.73	8.04	8.28	7.93	8.00	8.32
sp11	8.28	8.78	9.22	8.67	8.96	9.06
sp11a	7.29	7.42	7.50	7.11	7.36	7.39
sp12	6.27	6.79	7.32	6.45	6.78	7.21
sp12a	6.04	6.04	6.04	6.04	6.04	6.04
sp16	3.94	4.62	5.63	4.13	4.81	5.53
sp17	0.00	0.00	0.00	0.00	0.00	0.00
sp18	3.68	3.97	4.34	3.85	4.15	4.42
sp19	0.00	0.00	0.00	0.00	0.00	0.00
sp22	7.44	7.90	8.50	7.68	8.05	8.55
sp25	3.52	4.09	5.04	3.63	4.22	5.01
sp28	2.11	2.77	3.63	2.31	3.09	3.55
sp31	2.93	3.35	3.98	3.02	3.69	3.93
sp31c	7.66	8.03	8.58	7.88	8.09	8.58
sp32	3.40	3.89	4.63	3.57	4.08	4.28
sp32b	3.22	3.76	4.45	3.22	3.75	4.31
sp32c	8.30	8.70	9.35	8.44	8.65	9.25
sp33a	8.23	8.58	9.14	8.51	8.72	9.04
sp52	7.11	7.51	8.10	7.40	7.59	8.00

Serial @ 25 MHz

sp8	6.64	6.96	7.50	6.64	7.14	7.54
sp8b	7.66	7.97	8.28	7.73	7.97	8.16
sp11	8.05	8.65	9.22	8.32	8.80	9.14
sp11a	3.77	4.37	5.39	3.77	4.52	5.00
sp12a	1.99	1.99	1.99	1.99	1.99	1.99
sp18	3.19	3.57	4.01	3.40	3.74	4.09
sp19	0.00	0.00	0.00	0.00	0.00	0.00
sp32b	3.11	3.69	4.51	3.19	3.91	4.25
sp78s	13.30	15.39	18.48	13.40	16.26	18.72
sp79s	11.25	13.18	15.74	11.45	13.72	16.04
sp80s	10.40	12.73	16.36	10.43	13.78	16.97
sp103	25.66	27.29	29.53	25.99	27.83	29.80
sp104	24.32	25.60	27.54	24.40	26.21	27.77
sp153	12.89	14.87	17.99	13.13	15.92	18.43

Note: The above average/min/max values were obtained empirically by characterizing parts across the process window @ nominal VDD.

**For More Information On This Product,
Go to: www.freescale.com**

CHANGED PART IDENTIFICATION

Available upon request.

AFFECTED DEVICE LIST

KXPC855TCZP66D3
 KXPC855TZP66D3
 KXPC855TZP80D3
 KXPC860DCZP33C1
 KXPC860DCZP50C1
 KXPC860DCZP66C1
 KXPC860DEZP25A3
 KXPC860DEZP33C1
 KXPC860DEZP50C1
 KXPC860DEZP50D4
 KXPC860DEZP66C1
 KXPC860DEZP66D4
 KXPC860DEZP80D4
 KXPC860DHZP33C1
 KXPC860DHZP50C1
 KXPC860DHZP66C1
 KXPC860DTCZP50B5
 KXPC860DTZP50B3
 KXPC860DTZP50B5
 KXPC860ENCZP50C1
 KXPC860ENZP33C1
 KXPC860ENZP50C1
 KXPC860ENZP50D4
 KXPC860ENZP66C1
 KXPC860ENZP66D4
 KXPC860ENZP80D4
 KXPC860MHCZP50C1
 KXPC860MHZP33C1
 KXPC860MHZP50C1
 KXPC860MHZP66C1
 KXPC860PCZP66D3
 KXPC860PZP66D3
 KXPC860PZP80D3
 KXPC860PZP80D4
 KXPC860SRCZP33C1
 KXPC860SRCZP50C1
 KXPC860SRZP33C1
 KXPC860SRZP50C1
 KXPC860SRZP66C1
 KXPC860TCZP50B3
 KXPC860TCZP66D3
 KXPC860TZP50B2
 KXPC860TZP50B3
 KXPC860TZP50B5



KXPC860TZP66D3
KXPC860TZP80D3
KXPC860ZP33C1
KXPC860ZP50C1
KXPC860ZP66C1
PPC855PZP80E0
PPC855TZP66D2
PPC855TZP80E0
PPC860MHZP25A
PPC860MHZP50B
PPC860PZP80E0
PPC860SRZP50B
PPC860SRZP50C
PPC860TZP50B
SC530205TZP50B4
SC860PZP80D3W1
SC860PZPD3W1
XC860DCCZP50C1R2
XC860ENCZP50C1
XC860ENCZP50C1R2
XC860ENCZP50D3R2
XC860ENCZP66D3R2
XC860MHCZP50C1R2
XC860SRCZP33C1R2
XC860SRCZP50C1R2
XPC855TCZP50D3
XPC855TCZP66D3
XPC855TZP50D3
XPC855TZP50D3R2
XPC855TZP50D4
XPC855TZP66D3
XPC855TZP80D3
XPC855TZP80D4
XPC860CZP33C1
XPC860CZP40A3
XPC860CZP50C1
XPC860DCCZP33C1
XPC860DCCZP50C1
XPC860DCCZP66C1
XPC860DCZP25A3
XPC860DCZP25A3R2
XPC860DCZP33C1
XPC860DCZP33C1R2
XPC860DCZP50B
XPC860DCZP50C1
XPC860DCZP50C1R2
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XPC860DECZP33C1
XPC860DECZP50C1
XPC860DECZP50D3



XPC860DECZP66D3
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XPC860DHZP66C1
XPC860DPCZP50D3
XPC860DPCZP66D3
XPC860DPZP50D3
XPC860DPZP50D3R2
XPC860DPZP66D3
XPC860DPZP80D3
XPC860DPZP80D3R2
XPC860DTCZP50B5
XPC860DTCZP50D3
XPC860DTCZP66D3
XPC860DTZP50B3
XPC860DTZP50B5
XPC860DTZP50D3
XPC860DTZP66D3
XPC860DTZP80D3
XPC860ENCZP33C1
XPC860ENCZP50C1
XPC860ENCZP50D3
XPC860ENCZP66D3
XPC860ENZP25A3
XPC860ENZP25A3R2
XPC860ENZP33C1
XPC860ENZP40A3
XPC860ENZP50B
XPC860ENZP50C1
XPC860ENZP50C1R2
XPC860ENZP50D3
XPC860ENZP50D4
XPC860ENZP66C1
XPC860ENZP66C1R2
XPC860ENZP66D3
XPC860ENZP66D3R2
XPC860ENZP66D4
XPC860ENZP80D3



XPC860ENZP80D4
XPC860MHCZP33C1
XPC860MHCZP40A3
XPC860MHCZP50C1
XPC860MHZP25A3
XPC860MHZP33C1
XPC860MHZP33C1R2
XPC860MHZP40A3
XPC860MHZP50A3
XPC860MHZP50C1
XPC860MHZP50C1R2
XPC860MHZP66C1
XPC860MHZP66C1R2
XPC860MHZP80C1
XPC860PCZP50D3
XPC860PCZP66D3
XPC860PZP50D3
XPC860PZP50D4
XPC860PZP66D
XPC860PZP66D3
XPC860PZP66D3R2
XPC860PZP66D4
XPC860PZP80D
XPC860PZP80D3
XPC860PZP80D3R2
XPC860PZP80D4
XPC860SRCZP33C1
XPC860SRCZP50C1
XPC860SRCZP50D3
XPC860SRCZP66D3
XPC860SRCZP66D4
XPC860SRZP33C1
XPC860SRZP33C1R2
XPC860SRZP50C1
XPC860SRZP50C1R2
XPC860SRZP50D3
XPC860SRZP50D3R2
XPC860SRZP66C1
XPC860SRZP66C1R2
XPC860SRZP66D3
XPC860SRZP66D3R2
XPC860SRZP80D3
XPC860TCZP33B5
XPC860TCZP50B3
XPC860TCZP50B5
XPC860TCZP50D3
XPC860TCZP66D3
XPC860TZP33B3
XPC860TZP33B5
XPC860TZP50B2



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XPC860TZP50B3
XPC860TZP50B3R2
XPC860TZP50B5
XPC860TZP50B5R2
XPC860TZP50D3
XPC860TZP50D3R2
XPC860TZP66D3
XPC860TZP80D3
XPC860TZP80D4
XPC860ZP25A3
XPC860ZP33C1
XPC860ZP33C1R2
XPC860ZP50C1
XPC860ZP66C1

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