



INDEX

–A–

AA operand 4-49, 4-50, 4-51, 4-52, 9-2

add 4-6, 9-7

addc 4-6, 9-8

adde 4-7, 9-9

addi 4-6, 9-10, E-16

addic 4-6, 9-11, 9-12

addic. 4-6

addis 4-6, 9-13, E-16

addme 4-7, 9-14

Address calculation

branch instructions 4-49

Addressing

branch conditional relative 4-50

branch conditional to absolute 4-52

branch conditional to count register 4-53

branch conditional to link register 4-52

branch relative 4-49

branch to absolute 4-51

immediate index, floating-point 4-41

register indirect with immediate index, integer 4-30

register indirect with index, integer 4-31

register indirect, floating-point 4-41

register indirect, integer 4-32

Addressing modes 4-1

addze 4-8, 9-15

ADR field (in ICADR) 5-5

ALE 8-59

ALEE 8-61

Alignment exception 6-23

ALU-BFU 1-8, 7-5

and 4-13, 9-16

andc 4-14, 9-17

andi 4-13, 9-18

andis 4-13

andis. 9-19

Arithmetic instructions

floating point 4-19

integer 4-5

Asynchronous exceptions 6-4, 6-8

Atomic memory references

lwarx 9-101

stwcx. 4-65, 9-169, D-1

Atomic memory references

lwarx D-1

–B–

b 4-56, 9-20

ba 4-56

Back trace 8-8

bc 4-57, 9-21

bca 4-57

bcctr 4-57, 9-25

bcctrl 4-57

bcl 4-57

bcla 4-57

bclr 4-57, 9-27

bclrl 4-57

BD operand 4-50, 9-2

BE bit 2-15, 6-15

BI operand 4-56, 9-2, E-5

Big-endian mode 3-2, 3-3

bl 4-56

bla 4-56

Blockage 7-11

BO operand 9-2, E-5

BO operand encodings 4-54

BPU 1-7

Branch

prediction 4-54

Branch folding 1-5, 7-1

example 7-22

Branch instructions 4-48

address calculation 4-49

condition register logical 4-57

description 4-56

EA generation 4-2

simplified mnemonics 4-59, E-4

Branch prediction E-10

and instruction cache 5-6

example 7-23

Branch processing unit 1-7

Branch trace enable 2-15, 6-15

Breakpoint counter A value and control register 8-57

Breakpoint counter B value and control register 8-58

Breakpoints 8-11

data 6-47

instruction 6-48

maskable external 6-49

non-maskable external 6-49

BRKNOMSK 8-56

Bus error 6-21

Byte ordering 3-2

BYTES field 2-11

–C–

C bit 2-6

CA bit 2-11, 4-5

Cache, instruction. See Instruction cache

Carry 2-11



Carry bit 4-5
CCER 5-4
CGBMSK 8-54
CHBMSK 8-54
Checkstop enable 6-21
Checkstop state 6-22
 and debug mode 8-39
CHSTP bit 8-59
CHSTPE 8-61
CHSTPE bit 6-21
Clock mode, development port 8-26
CMD field 5-4
cmp 4-12, 9-30
CMPA–CMPD 8-50
CMPE–CMPF 8-50
CMPG–CMPH 8-51
cmpi 4-12, 9-31
cmpl 4-12, 9-32
cmpli 4-12, 9-33
CNTC 8-57
cntlzw 4-14, 9-34
CNTV 8-57
Comparator A–D value registers 8-50
Comparator E–F value registers 8-50
Comparator G–H value registers 8-51
Compare and swap D-3
Compare instructions
 and condition register 2-10
 floating point 4-27
 integer 4-11
 simplified mnemonics E-2
Compare size 8-54
Compare type 8-52, 8-54
Compare types 8-15
Complement register, simplified mnemonic E-17
Completed instructions 6-1
Condition register 1-12, 2-8
 and compare instructions 2-10
 logical instructions, simplified mnemonics E-11
Context synchronization 7-10
Conversions, floating point 4-25, C-1
Count register 2-12
COUNTA 8-57
COUNTB 8-58
CPU exception encoding 8-35
CR 1-12, 2-8, 2-12
 and compare instructions 2-10
 Move to/from 4-60
CR0 field 2-9
CR1 field 2-9
crand 4-58, 9-35
crandc 4-58, 9-36
crbA 9-2
crbB 9-2
crbD 9-2
creqv 4-58, 9-37
crfD 9-2
crfS 9-2
CRM 9-2
crnand 4-58, 9-38

crnor 4-58, 9-39
cror 4-58, 9-40
crorc 4-58, 9-41
CRWE 8-54
CRWF 8-54
crxor 4-58, 9-42
CSG 8-54
CSH 8-54
CTA 8-52
CTB 8-52
CTC 8-52
CTD 8-52
CTE 8-54
CTF 8-54
CTG 8-54
CTH 8-54

–D–

DAE/source instruction service register 2-16, 6-24
 settings for alignment exception 6-25
DAR 2-16
DAT field (in ICSDAT) 5-5
Data address register 2-16
Data alignment 3-1
Data breakpoint exception 6-47
Debug enable register 6-1, 8-60
Debug mode 6-1, 8-36
 checkstop state 8-39
 enabling 8-36
 entering 8-37
 exiting 8-39
 program trace 8-6
DEC 2-17
DECE 8-59
DECEE 8-61
Decrementer exception 6-29
Decrementer register 2-17
Denormalization 3-17
Denormalized numbers 3-14
DER 6-1, 8-60
Development Port
 trap enable selection 8-52
Development port 8-22
 clock mode selection 8-26
 input transmissions 8-32
 ready bit 8-35
 registers 8-25
 serial data out 8-33
 shift register 8-26
 signals 8-23
 transmission sequence 8-40
 transmissions 8-31
Development serial clock 8-23
Development serial data in 8-24
Development serial data out 8-25
Development Support
 SPRs 4-64
Development support 8-1
 I-bus support 8-16
 instruction cache 5-12



- L-bus support 8-17
- registers 8-46
- Dispatch stage 1-9, 7-4
- divw 4-10, 9-43
- divwu 4-11, 9-45
- DIW0EN 8-52
- DIW1EN 8-52
- DIW2EN 8-52
- DIW3EN 8-52
- DLW0EN 8-56
- DLW1EN 8-56
- DPI 8-60
- DPIR/DPDR input transmissions 8-32
- DSCK 8-23
- DSDI 8-24
- DSDO 8-25
- DSE 8-59
- DSEE 8-61
- DSISR 2-16, 6-24
 - settings for alignment exception 6-25

-E-

- EA 4-2
- EBRK 8-60
- ECR 8-58
- EE bit 2-15, 2-20, 6-5, 6-10, 6-15
- Effective address calculation 4-2
 - branches 4-49
 - loads and stores 4-30, 4-41
- EID 2-21, 6-10
- EIE 2-21, 6-10
- eieio 4-65, 4-67, 9-46
- Enabling debug mode 8-36
- Entering debug mode 8-37
- eqv 4-14, 9-47
- Exception cause register 8-58
- Exception little endian mode 6-15
- Exception prefix 2-15, 6-5, 6-15
- Exceptions 1-16, 6-1
 - alignment 6-23
 - asynchronous 6-4, 6-8
 - classes 6-2
 - data breakpoint 6-47
 - decrementer 6-29
 - enabling and disabling 6-16
 - external interrupt 6-22
 - floating-point assist 6-31
 - floating-point unavailable 6-28
 - instruction breakpoint 6-48
 - little endian mode 2-15
 - machine check 6-21
 - maskable 6-5, 6-16
 - external breakpoint 6-49
 - non-maskable 6-5
 - external breakpoint 6-49
 - order and priority 6-10
 - ordered and unordered 6-2
 - precise 6-7
 - processing 6-13
 - program 6-26

- recovery from 6-9
- reset 6-20
- software emulation 6-46
- synchronous and precise 6-2
- system call 6-29
- timing 6-18
- trace 6-30
- vector table 6-5
- Execute stage 1-9, 7-4
- Execution serialization 7-9
- Execution units 1-6
- Exiting debug mode 8-39
- EXP field 3-11
- External interrupt 6-22
 - disable 2-21, 6-10
 - enable 2-15, 2-20, 2-21, 6-5, 6-10, 6-15
- EXTI 8-59
- EXTIE 8-61
- extsb 4-14, 9-48
- extsh 4-14, 9-49

-F-

- fabs 4-48, 9-50
- fadd 4-19, 9-51, 9-52
- fadds 4-20
- fcmpo 4-28, 9-53
- fcmpu 4-28, 9-54
- fctiw 4-26, 9-55
- fctiwz 4-27, 9-56
- fdiv 4-21, 9-57, 9-58
- fdivs 4-22
- FE bits 2-15, 2-16, 6-15, 6-16
- FE flag 2-6
- Fetch and add D-2
- Fetch and AND D-3
- Fetch and no-op D-2
- Fetch and store D-2
- Fetch serialization 7-10
- Fetch serialized 8-2
- FEX bit 2-5, 6-36
- FG bit 2-6
- FI bit 2-6, 3-20, 6-37
- FL bit 2-6
- Floating-point
 - arithmetic instructions 4-19
 - assist exception 6-31, 6-32
 - available 2-15, 6-15
 - compare instructions 4-27
 - condition code 2-6
 - conversions C-1
 - data 3-10
 - data handling and precision 3-17
 - denormalized numbers 3-14
 - enabled exception summary 2-5, 6-36
 - enabled exceptions 6-36
 - equal or zero 2-6
 - exception mode 2-15, 2-16, 6-15, 6-16
 - exception summary 2-5, 6-36
 - exceptions cause register 6-34
 - execution models 3-21



FPSCR instructions 4-28
fraction inexact 2-6, 6-37
fraction rounded 2-6, 6-37
greater than or positive 2-6
IEEE operations 3-22
inexact exception 2-6, 6-37
 enable 2-7, 6-38
infinities 3-15
invalid operation exception
 conditions 6-42
 enable 2-7, 6-38
 for $x \times 0$ 2-6, 6-37
 for x/x 2-6, 6-37
 for $x \times x$ 2-6, 6-37
 for $0/0$ 2-6, 6-37
 for invalid compare 2-6, 6-37
 for invalid integer convert 2-7, 6-38
 for invalid square root 2-7, 6-37
 for SNaN 2-6, 6-37
 for software request 2-7, 6-37
 inexact 6-45
 overflow 6-44
 summary 2-5, 6-36
 underflow 6-44
 zero divide 6-43
less than or negative 2-6
load instructions 4-42
models C-1
move instructions 4-47
multiply-add instructions 3-24, 4-22
non-IEEE operation 3-25
normalization and denormalization 3-17
normalized numbers 3-13
overflow exception 2-6, 6-36
 enable 2-7, 6-38
registers 2-3
result class descriptor 2-6
result flags 2-6, 6-37
round to single-precision 3-19
rounding 3-19
rounding and conversion instructions 4-25
rounding control 2-7, 6-38
sign of result 3-16
single precision 3-18
software envelope 3-25, 6-31
status and control register 1-12, 2-4, 6-36
store instructions 4-44
unavailable exception 6-28
underflow exception 2-6, 6-36
unit 1-8, 7-6
unordered or NaN 2-6
zero divide exception 2-6, 6-37
 enable 2-7, 6-38
zero values 3-14
Flow control instructions 4-48
 branch instructions 4-56
 condition register logical 4-57
 system linkage 4-58
FM 9-2
fmadd 4-22, 9-59, 9-60
fmadds 4-23
fmr 4-48, 9-61
fmsub 4-23, 9-62, 9-63
fmsubs 4-23
fmul 4-21, 9-64, 9-65
fmuls 4-21
fnabs 4-48, 9-66
fneg 4-48, 9-67
fnmadd 4-24, 9-68, 9-69
fnmadds 4-24
fnmsub 4-25, 9-70, 9-71
fnmsubs 4-25
formats 9-1
FP 6-15
FP bit 2-15
FPASE 8-59
FPASEE 8-61
FPCC bit 2-6
FPECR 6-34
FPRF 6-37
FPRF field 2-6
FPRs 2-3
FPSCR 1-12, 2-4, 6-36
FPSCR instructions 4-28
FPSCRXX bit 3-25
FPUVE 8-59
FPUVEE 8-61
FR 2-6
FR bit 3-20, 6-37
frA 9-2
FRACTION field 3-11
frB 9-2
frC 9-2
frD 9-2
Freeze 8-39
frpsx 3-19
frS 9-2
frsp 4-26, 9-72
fsub 4-20, 9-73, 9-74
fsubs 4-20
FU bit 2-6
FX bit 2-5, 6-36

-G-

G bit 3-22
General SPRs 2-19
General-purpose registers 1-12, 2-3
GPRs 1-12, 2-3
Guard bit 3-22

-H-

History buffer 1-5, 6-7, 7-1
 flush status pins 8-6
 full, example 7-20
Hit, I-cache 5-6

-I-

IBRK 8-60



- I-bus
 - watchpoint programming 8-52
- I-bus support 8-16
 - control register 8-51
- I-cache. See Instruction cache
- ICADR 2-21, 5-3, 5-5, 5-10
- icbi 4-68, 5-7, 9-75
- ICCST 2-21, 5-3
- ICDAT 2-21, 5-3, 5-5, 5-11
- ICTRL 8-51
- IEEE operations, floating point 3-22
- IEN bit 5-4
- Ignore first match 8-52
- IIFM 8-52
- ILE bit 2-15, 6-15
- IMM 9-2
- IMUL-IDIV 1-8, 7-5
- Inexact bit 3-25
- Infinities 3-15
- Input/output in little-endian mode 3-10
- Instruction 9-1
 - blockage 7-11
 - breakpoint exception 6-48
 - cache 1-9
 - management instruction 4-68
 - completed 6-1
 - fields 9-1
 - flow 1-5, 7-1
 - issue 7-3
 - latency 7-11
 - memory addressing in little-endian mode 3-8
 - pipeline 1-9, 7-3
 - queue status pins 8-5
 - retired 1-5, 1-9, 6-7, 7-1
 - sequencer 1-5, 7-1
 - set 1-14
 - set summary 4-1
 - timing 1-9, 7-1, 7-3
- Instruction cache 5-1
 - address register 2-21, 5-3, 5-5, 5-10
 - and branch prediction 5-6
 - and zero-wait-state memories 5-11
 - block invalidate 5-7
 - coherency 5-11
 - command field 5-4
 - commands 5-7
 - control and status register 2-21, 5-3
 - data path 5-3
 - data port 2-21, 5-3
 - data register 5-5, 5-11
 - debugging support 5-12
 - disable command 5-9
 - enable command 5-9
 - enable status bit 5-4
 - error types 5-4
 - hit 5-6
 - invalidate all 5-8
 - load & lock 5-8
 - miss 5-6
 - operation 5-5
 - organization 5-1
 - reading 5-10
 - reset sequence 5-11
 - SPRs 5-3
 - unlock all 5-9
 - unlock line 5-9
- Instruction fetch
 - show cycle control 8-2, 8-53
 - show cycles 8-4
- Instructions 4-58, 9-1
 - add 4-6, 9-7
 - addc 4-6, 9-8
 - adde 4-7, 9-9
 - addi 4-6, 9-10, E-16
 - addic 4-6, 9-11, 9-12
 - addic. 4-6
 - addis 4-6, 9-13, E-16
 - addme 4-7, 9-14
 - addze 4-8, 9-15
 - and 4-13, 9-16
 - andc 4-14, 9-17
 - andi 4-13, 9-18
 - andis 4-13
 - andis. 9-19
 - b 4-56, 9-20
 - ba 4-56
 - bc 4-57, 9-21
 - bca 4-57
 - bcctr 4-57, 9-25
 - bcctrl 4-57
 - bcl 4-57
 - bcla 4-57
 - bclr 4-57, 9-27
 - bclrl 4-57
 - bl 4-56
 - bla 4-56
 - branch 4-56
 - cmp 4-12, 9-30
 - cmpi 4-12, 9-31
 - cmpl 4-12, 9-32
 - cmpli 4-12, 9-33
 - cntlzw 4-14, 9-34
 - condition register logical 4-57
 - crand 4-58, 9-35
 - crandc 4-58, 9-36
 - creqv 4-58, 9-37
 - crnand 4-58, 9-38
 - crnor 4-58, 9-39
 - cror 4-58, 9-40
 - crorc 4-58, 9-41
 - crxor 9-42
 - divw 4-10, 9-43
 - divwu 4-11, 9-45
 - eieio 4-65, 4-67, 9-46
 - eqv 4-14, 9-47
 - extsb 4-14, 9-48
 - extsh 4-14, 9-49
 - fabs 4-48, 9-50
 - fadd 4-19, 9-51, 9-52
 - fadds 4-20



fcmpo 4-28, 9-53
fcmpl 4-28, 9-54
fctiw 4-26, 9-55
fctiwz 4-27, 9-56
fdiv 4-21, 9-57, 9-58
fdivs 4-22
floating-point
 arithmetic 4-19
 compare 4-27
 double-precision conversion, store 4-46
 FP status and control register 4-28
 move 4-47
 multiply-add 4-22
 rounding and conversion 4-25
flow control 4-48
fmadd 4-22, 9-59, 9-60
fmadds 4-23
fmr 4-48, 9-61
fmsub 4-23, 9-62, 9-63
fmsubs 4-23
fmul 4-21, 9-64, 9-65
fmuls 4-21
fnabs 4-48, 9-66
fneg 4-48, 9-67
fnmadd 4-24, 9-68, 9-69
fnmadds 4-24
fnmsub 4-25, 9-70, 9-71
fnmsubs 4-25
frsp 4-26, 9-72
fsub 4-20, 9-73, 9-74
fsubs 4-20
icbi 4-68, 9-75
instruction cache management 4-68
integer 4-4
 compare 4-11
 load 4-33
 logical 4-12
 move string 4-39
 rotate and shift 4-14
 store 4-36
integer arithmetic 4-5
isync 4-65, 4-67, 9-76
lbz 4-34, 9-77
lbzu 4-34, 9-78
lbzux 4-34, 9-79
lbzx 4-34, 9-80
lfd 4-43, 9-81
lfdl 4-43, 9-82
lfdx 4-43, 9-83
lfdx 4-43, 9-84
lfs 4-42, 9-85
lfsu 4-43, 9-86
lfsux 4-43, 9-87
lfsx 4-42, 9-88
lha 4-35, 9-89
lhau 4-35, 9-90
lhaux 4-35, 9-91
lhax 4-35, 9-92
lhbrx 4-38, 9-93
lhz 4-34, 9-94
lhzu 4-34, 9-95
lhzux 4-35, 9-96
lhzx 4-34, 9-97
lmw 4-39, 9-98
load
 floating-point 4-42
load/store 4-30
 address generation, floating-point 4-41
 address generation, integer 4-30
 integer load 4-33
 integer multiple 4-38
 with byte reversal 4-37
lswi 4-40, 9-99
lswx 4-40, 9-100
lwarx 4-67, 9-101
lwbrx 4-38, 9-102
lwz 4-35, 9-103
lwzu 4-35, 9-104
lwzux 4-36, 9-105
lwzx 4-35, 9-106
mcrf 4-58, 9-107
mcrfs 4-29, 9-108
mcrxr 4-61, 9-109
memory control 4-68
memory synchronization 4-65
mfcrl 4-61, 9-110
mffs 4-29, 9-111
mfmsr 4-61, 9-112
mfspr 4-62, 9-113
move to/from MSR and CR 4-60
move to/from SPR 4-61
mtcrf 4-61, 9-115, 9-117
mtfsb0 4-29, 9-118
mtfsb1 4-29, 9-119
mtfsf 4-29, 9-120, 9-137
mtfsfi 4-29, 9-121
mtmsr 4-61, 9-122
mtspr 4-62, 9-123
mulhw 4-9, 9-125
mulhwl 4-9, 9-126
mulli 4-8, 9-127
mullw 4-9, 9-128
nand 4-13, 9-129
neg 4-8, 9-130
no-op E-16
nor 4-13, 9-131
or 4-13, 9-132
orc 4-14, 9-133
ori 4-13, 9-134
oris 4-13, 9-135
processor control 4-60
rfi 4-59, 9-136
rlwimi 4-17
rlwinm 4-16, 9-138
rlwnm 9-140
sc 4-59, 9-141
slw 4-18, 9-142
sraw 4-18, 9-143
srawi 4-18, 9-144
srw 4-18, 9-145



stb 4-37, 9-146
stbu 4-37, 9-147
stbux 4-37, 9-148
stbx 4-37, 9-149
stfd 9-150
stfdu 9-151
stfdx 9-152
stfdx 9-153, 9-154
stfs 9-155
stfsu 9-156
stfsux 9-157
stfsx 9-158
sth 4-37, 9-159
sthbrx 4-38, 9-160
sthu 4-37, 9-161
sthux 4-37, 9-162
sthx 4-37, 9-163
stmw 4-39, 9-164
store
 floating-point 4-44
stswi 4-40, 9-165
stswx 4-40, 9-166
stw 4-37, 9-167
stwbrx 4-38, 9-168
stwcx 4-67
stwcx. 4-66, 9-169
stwu 4-37, 9-170
stwux 4-37, 9-171
stwx 4-37, 9-172
subf 4-6, 9-173
subfc 4-7, 9-174
subfe 4-7, 9-175
subfic 4-6, 9-176
subfme 4-7, 9-177
subfze 4-8, 9-178
sync 4-65, 4-68, 9-179
system linkage 4-58
trap 4-59
tw 4-60, 9-180
twi 4-60, 9-181
xor 4-13, 9-182
xori 4-13, 9-183
xoris 4-13, 9-184
Integer
 instructions 4-4
 arithmetic 4-5
 compare 4-11
 load 4-33
 load/store 4-33
 logical 4-12
 move string 4-39
 rotate and shift 4-14
 store 4-36
Integer exception register 2-10
Invalidate all 5-8
IP bit 2-15, 6-5, 6-15
IRQ 6-22
ISCTL 8-2, 8-53
ISE 8-59
ISEE 8-61
Issued instructions 7-3
isync 4-65, 4-67, 9-76
IW 8-52
-L-
Latency 7-11
LBRK 8-60
L-bus support 8-17
 control register 1 8-53
 control register 2 8-55
lbz 4-34, 9-77
lbzu 4-34, 9-78
lbzux 4-34, 9-79
lbzx 4-34, 9-80
LCTRL1 8-53
LCTRL2 8-55
LE bit 2-15, 6-15
lfd 4-43, 9-81
lfdu 4-43, 9-82
lfdux 4-43, 9-83
lfdx 4-43, 9-84
lfs 3-18, 4-42, 9-85
lfsu 4-43, 9-86
lfsux 4-43, 9-87
lfsx 4-42, 9-88
lha 4-35, 9-89
lhau 4-35, 9-90
lhaux 4-35, 9-91
lhax 4-35, 9-92
lhbrx 4-38, 9-93
lhz 4-34, 9-94
lhzu 4-34, 9-95
lhzux 4-35, 9-96
lhzx 4-34, 9-97
LI 9-2
LI operand 4-49
Link register 2-11
List insertion D-4
Little endian mode 2-15
Little-endian mode 3-2, 6-15
 input/output 3-10
 instruction memory addressing 3-8
 load and store multiple instructions 3-8
 misaligned operands 3-6
 misaligned scalars 3-6
 string operations 3-7
LK 9-2
lmw 4-39, 9-98
Load
 address, simplified mnemonic E-16
 immediate, simplified mnemonic E-16
 instructions 4-30
 floating point 4-42
 integer 4-33
Load & lock 5-8
Load floating-point single-precision 3-18
Load/store
 address generation 4-30
 integer 4-30
 byte reverse instructions 4-37



- multiple instructions, integer 4-38
- Load/store multiple instructions
 - in little-endian mode 3-8
- Loadstore
 - address generation 4-2
- Logical instructions, integer 4-12
- LR 2-11
- lswi 4-40, 9-99
- lswx 4-40, 9-100
- LW0EN 8-55
- LW0IA 8-55
- LW0IADC 8-55
- LW0LA 8-55
- LW0LADC 8-55
- LW0LD 8-55
- LW0LDDC 8-55
- LW1EN 8-55
- LW1IA 8-56
- LW1IADC 8-56
- LW1LA 8-56
- LW1LADC 8-56
- LW1LD 8-56
- LW1LDDC 8-56
- lwarx 4-67, 9-101, D-1
- lwbx 4-38, 9-102
- lwz 4-35, 9-103
- lwzu 4-35, 9-104
- lwzux 4-36, 9-105
- lwzx 4-35, 9-106

—M—

- Machine check
 - enable 2-15, 6-15, 6-21
 - exception 6-21
- machine check
 - exception
 - enable 6-21
- Machine state register 1-12, 2-13, 6-14
- Machine status save/restore register 0 2-18
- Machine status save/restore register 1 2-19
- Maskable
 - exceptions 6-5
 - external breakpoints 6-49
- Maskable exceptions 6-16
- MB 9-2
- MCE 8-59
- MCEE 8-61
- MCIE bit 6-21
- mcrf 4-58, 9-107
- mcrfs 4-29, 9-108
- mcrxr 4-61, 9-109
- ME bit 2-15, 6-15, 6-21, 9-2
- Memory
 - control instructions 4-68
 - operands 4-2
 - organization 3-1
 - synchronization
 - eieio 4-65
 - isync 4-65
 - stwcx. 4-66

- sync 4-65
- mfcrr 4-61, 9-110
- mffs 4-29, 9-111
- mfmsr 4-61, 9-112
- mfscr 4-62, 9-113
- Misaligned operands
 - little-endian mode 3-6
- Miss, instruction cache 5-6
- Move
 - instructions, floating point 4-47
 - register, simplified mnemonic E-17
 - string instructions, integer 4-39
 - to/from SPR Instructions 4-61
- MSR 1-12, 2-13, 6-14
 - Move to/from 4-60
- mtcrf 4-61, 9-115, 9-117
- mtfsb0 4-29, 9-118
- mtfsb1 4-29, 9-119
- mtfsf 4-29, 9-120, 9-137
- mtfsfi 4-29, 9-121
- mtmsr 4-61, 9-122
- mtsrr 4-62, 9-123
- mulhw 4-9, 9-125
- mulhwu 4-9, 9-126
- mulli 4-8, 9-127
- mullw 4-9, 9-128
- Multiple-precision shifts B-1
- Multiply-add instructions, floating point 3-24, 4-22

—N—

- nand 4-13, 9-129
- NANs 3-15
- NB 9-3
- neg 4-8, 9-130
- NI bit 2-7, 3-25, 6-38
- Non-IEEE floating-point operation 2-7, 3-25, 6-38
- Non-maskable
 - exceptions 6-5
 - external breakpoint 6-49
- Non-recoverable interrupt 2-21, 6-10
- No-op E-16
- nor 4-13, 9-131
- Normalized numbers 3-13, 3-17
- Not a Numbers 3-15
- NRI 2-21, 6-10
- Null output encoding 8-35

—O—

- OE bit 2-7, 6-38, 9-3
- or 4-13, 9-132
- orc 4-14, 9-133
- Ordered exceptions 6-2
- ori 4-13, 9-134
- oris 4-13, 9-135
- OV (overflow) bit 2-11, 4-5
- OX bit 2-6, 6-36

–P–

Pipeline, instruction 1-9, 7-3
 PR 2-1
 PR bit 2-15, 6-15
 PRE 8-59
 Precise exceptions 6-2, 6-7
 PREE 8-61
 Privilege level 2-1
 Privilege levels 2-15, 6-15
 Process switching 6-18
 Processor control instructions 4-60
 Processor version register 2-20
 Program 6-26
 exception 6-26
 flow tracking 8-1
 flow-tracking
 status pins 8-5
 trace
 back 8-8
 in debug mode 8-6
 window 8-8
 Programming models 2-1
 PVR 2-20

–R–

R bit 3-22
 rA 9-3
 rB 9-3
 Rc 9-3
 RCPU
 execution units 1-6
 registers 2-1
 rD 9-3
 RE bit 6-15
 Ready bit, development port 8-35
 Recoverable exception 2-15, 2-20, 6-5, 6-9, 6-10, 6-15
 Register transfer language 9-3
 Registers 2-1
 CMPA–CMPD 8-50
 CMPE–CMPF 8-50
 CMPG–CMPH 8-51
 COUNTA 8-57
 COUNTB 8-58
 CR 2-8, 2-12
 DAR 2-16
 DEC 2-17
 DER 6-1, 8-60
 development port 8-25
 development support 8-46
 development support shift register 8-26
 DSISR 6-24
 ECR 8-58
 FPRs 2-3
 FPSCR 2-4, 6-36
 GPRs 2-3
 ICADR 2-21, 5-3, 5-10
 ICCST 2-21, 5-3
 ICDAT 2-21, 5-3, 5-11
 ICTRL 8-51

LCTRL1 8-53
 LCTRL2 8-55
 LR 2-11
 MSR 2-13, 6-14
 PVR 2-20
 SPRGs 2-19
 SRR0 2-18
 SRR1 2-19
 supervisor level 2-13
 TB 2-12
 TECR 8-26
 user level 2-3
 XER 2-10
 Reset exception 6-20
 and instruction cache 5-11
 Retired instructions 1-5, 1-9, 6-7, 7-1
 Retirement stage 1-9, 7-4
 rfi 4-59, 6-18, 9-136
 RI bit 2-15, 2-20, 6-5, 6-9, 6-10
 rlwimi 4-17
 rlwinm 4-16, 9-138
 rlwnm 9-140
 RN field 2-7, 6-38
 Rotate and shift instructions 4-14
 simplified mnemonics E-3
 Round bit 3-22
 Round to floating-point single-precision 3-18
 Rounding, floating point 3-19, 4-25
 rS 9-3
 RTL 9-3

–S–

S (sign bit) 3-11
 sc 4-59, 9-141
 SE bit 2-15, 6-15
 SEE 8-59
 Sequencer 1-5, 7-1
 Sequencing error encoding 8-34
 Serialization 7-9
 execution 7-9
 fetch 7-10, 8-2
 SH 9-3
 Shift instructions, integer 4-14
 Shifts, multiple precision B-1
 Show cycles 8-4
 SIE mode 6-34
 SIMM 9-3
 Simplified mnemonics 4-68, E-1
 branch instructions E-4
 compare instructions E-2
 condition register logical instructions E-11
 miscellaneous 4-68
 rotate and shift instructions E-3
 special-purpose registers E-15
 SPRs E-15
 subtract instructions E-2
 trap instructions E-12
 Single-precision floating point 3-18
 Single-step trace enable 2-15, 6-15
 SIW0EN 8-52





SIW1EN 8-52
SIW2EN 8-52
SIW3EN 8-52
slw 4-18, 9-142
SLW0EN 8-56
SLW1EN 8-56
SO bit 2-11, 4-5
Software emulation exception 6-46
Software envelope 3-25, 6-31
Software monitor support 8-46
Software trap enable selection 8-52
Special-purpose registers 1-12
 general 2-19
 simplified mnemonics E-15
 supervisor level 1-13, 4-63
 user level 1-12, 4-62
Split field notation 9-1
SPR 9-3
SPRG0–SPRG3 2-19
SPRGs 2-19
SPRs
 development support 4-64
 general 2-19
 instruction cache 5-3
 simplified mnemonics E-15
SPRs. See Special-purpose registers
sraw 4-18, 9-143
srawi 4-18, 9-144
SRR0 2-18
SRR1 2-19
srw 4-18, 9-145
stb 4-37, 9-146
stbu 4-37, 9-147
stbux 4-37, 9-148
stbx 4-37, 9-149
stfd 9-150
stfdi 9-151
stfdix 9-152
stfdx 9-153, 9-154
stfs 3-18, 9-155
stfsu 9-156
stfsux 9-157
stfsx 9-158
sth 4-37, 9-159
sthbrx 4-38, 9-160
sthu 4-37, 9-161
sthux 4-37, 9-162
sthx 4-37, 9-163
Sticky bit 3-22
stmw 4-39, 9-164
Store
 floating-point single-precision 3-18
Store instructions 4-30
 floating point 4-44
 integer 4-36
String instructions, timing 7-8
String operations
 in little-endian mode 3-7
stswi 4-40, 9-165
stswx 4-40, 9-166
stw 4-37, 9-167
stwbrx 4-38, 9-168
stwcx 4-67
stwcx. 4-66, 9-169, D-1
stwu 4-37, 9-170
stwux 4-37, 9-171
stwx 4-37, 9-172
subf 4-6, 9-173
subfc 4-7, 9-174
subfe 4-7, 9-175
subfic 4-6, 9-176
subfme 4-7, 9-177
subfze 4-8, 9-178
Subtract instructions, simplified mnemonics E-2
Summary overflow 2-11, 4-5
Supervisor
 privilege level 2-1
Supervisor level
 registers 2-13
 returning from 6-18
 SPRs 1-13
Supervisor-Level
 SPRs 4-63
SUSG 8-54
SUSH 8-54
sync 4-65, 4-68, 9-179
Synchronization
 context 7-10
 primitives D-2
 programming examples D-1
Synchronized ignore exceptions 6-34
Synchronous exceptions 6-2
 ordering 6-12
SYSE 8-59
SYSEE 8-61
System call exception 6-29
System linkage instructions 4-58

–T–

TB 2-12
TBL 2-13, 2-17
TBU 2-13, 2-17
TEA 6-21
TECR 8-26
Test and set D-3
Time base 2-12
Timing, instruction 1-9
TO 9-3
TO operand 4-60
TR 8-59
Trace 8-8
 window 8-8
Trace exception 6-30
Trap enable
 input transmissions 8-32
 programming 8-20
Trap enable control register 8-26
Trap instructions 4-59
 simplified mnemonics E-12
TRE 8-61

tw 4-60, 9-180
twi 4-60, 9-181



-U-

UIMM 9-3
UISA register set 2-3
Unlock all 5-9
Unlock line 5-9
Unordered exceptions 6-2
User
 privilege level 2-1
User level
 registers 2-3
 SPRs 1-12, 4-62
UX bit 2-6, 6-36

-V-

Valid data encoding 8-34
VE bit 2-7, 6-38
Vector table, exceptions 6-5
VF signals 8-5
VFLS signals 8-6
VSYNC 8-10
VX 6-36
VX bit 2-5
VXCVI bit 2-7, 6-38
VXIDI 2-6
VXIDI bit 6-37
VXIMZ bit 2-6, 6-37
VXISI 2-6
VXISI bit 6-37
VXSNAN 2-6
VXSNAN bit 6-37
VXSQRT bit 2-7, 6-37
VXSQRT bit 2-7, 6-37
VXVC bit 2-6, 6-37
VXZDZ bit 2-6, 6-37

-W-

Watchpoints 8-11
Window trace 8-8
Writeback stage 1-9, 6-1, 7-4

-X-

X bit 3-22
XE bit 2-7, 6-38
XER 2-10
XO 9-3
xor 4-13, 9-182
xori 4-13, 9-183
xoris 4-13, 9-184
XX bit 2-6, 6-37

-Z-

ZE bit 2-7, 6-38
Zero values 3-14
ZX bit 2-6, 6-37

