

ELSA WINman (ELSA ȳ'è), ìfwf<fv

ELSA WINman (ELSA ȳ'è), í AELSA fOf%oftfBfbfN f{[fh, ÆELSA Windows fhf %ofCfo, ðf,fjf^, É“K†,³,¹,é,½,ß, ìfvf[]Of%of€, Å, ·[]B

[]Ú,µ,ç,±,Æ,í[]AZÿ, ìfL[]f[]fh, ðfNfŠfbfN, ·, é, ©[]Afwf<fv, ì[]ö^ø, ðfNfŠfbfN, µ, Ä, -,³/₄,³,ç[]B


WINman <N“ ®f_fCfAf[]fO

f,fjf^, ìfvf[]pfefB

fOf%oftfBfbfN f,[]fh, ì[]C³[]Afjf%o[][] [“x/‰đ'œ“x/f^fCf~f“fO, ì'²[]®

fOf%oftfBfbfN f,[]fh/f^fCf~f“fO

ELSA WINman (ELSA)

ELSA WINman (ELSA )
Í AELSA fOf%oftfBfbfN f{[fh,Æ ELSA Windows fhf %ofCfo,ðf,fjf^,É“K[±,³,¹,é,½,ß,lfvf[fof%of€,Å,·[B [fffBfXfvf[efC,lfvf[fpfefB] ,lf_fCfAf[fo,²Š],ç,Ä,ç,È,¯,ê,Î[A,±,±,ðNfŠfbfN,µ,Ä,-,¾,³,ç [B

,Ü,½“_f_fCfAf[fo,ì‘†,Å[WINman]f_fCfAf[fo,²Š],ç,Ä,ç,È,ç,Æ,«,Í[A 
,lf^fu,ðNfŠfbfN,µ,Ä,,¾,³,ç [B

[fXfL[f€](ff[f^ fzfbfg)

^È‘O,lfOf%oftfBfbfN f,[fh,ð•Ü‘¶,µ,Ä,ç,é[ê[±[A,» ,lf,[fh,É[Ø,è‘Ö,¡,é,± ,Æ,²,Å,«,Ü,·[B

[f,fjf^]

Zg—p,·,·,éf,fjf^,ð“ü—í,µ,Ü,·[B[·[X...],ðNfŠfbfN,µ[A“ü—í,µ,½‘l,ðŠm”F,µ,Ä,-,¾,³,ç [B

[A,à[d—v,È,ì,Í[Af,fjf^,ì[A‘á[...·½’-□,Žü”g□” (kHz),Å,·(f,fjf^ ff[f^,ì[É^èŽQ[Æ]) [B

[fjf%□[□[“x]

256[F,©32768[F,©•K—v,Èfjf%□[□[“x,ð‘l‘ð,µ,Ü,·[B[Ú,µ,ç,±,Æ,Í[Afjf %□[□[“x,ðNfŠfbfN,µ,Ä,,¾,³,ç [B

[%ÅŽ<%ð‘œ“x]/[fo[f`fff<%ð‘œ“x]

1024 x 768,È,Ç[A•K—v,È%œ—È%ð‘œ“x,ðNfŠfbfN,µ,Ü,·[B[Ú,µ,ç,±,Æ,Í[A %ð‘œ“x,ðNfŠfbfN,µ,Ä,,¾,³,ç [B

[fŠftf[efbvf... f[ef[f^g]


75 Hz,È,Ç[A•K—v,ÈfŠftf[efbvf... f[ef[f^g,ð‘l‘ð,µ,Ü,·[B[Ú,µ,ç,± ,Æ,Í[AfŠftf[efbvf... f[ef[f^g,ðŽQ[Æ,µ,Ä,,¾,³,ç [B

[Ú[×...],ðNfŠfbfN,·,é,Æ[A,æ,è[³Šm,È²[®,ð[s,±,Æ,²,Å,«,Ü,·[B

[OK]/[“K—p]

fefXfg fpf^ [f“ ,²À‘è,µ,½,ç[A,Ü,·,Ý‘è“à—

e,ð•Ü‘¶,µ[AWindows,ð[Ä<N“® ,µ,Ä,©,ç[AffBfXfvf[efC,lfTfCfY,Æ^É‘u,ì²[®,ðŽn ,ß,Ü,·[B

fffBfXfvf[efC,lfTfCfY,Æ^É‘u,ðf,fjf^,Å²[®,µ,Ä,Ý,Ä,,¾,³,ç [B,±,Ü,,ç ,©,È,ç[ê[±,Í[AWINman (ELSA ) ,Åf,fjf^ f^fCf~f“fo,ð²[®,·,é,± ,Æ,à,Å,«,Ü,·[B

[f,fjf^,ì[±[~](f}f<f`fXfNfŠ[f“ ,ì,Ý)

fRf“fsf... [f^ ,Éf}f<f`fXfNfŠ[f“‘î%ž,ì•;□” ,)ELSA fOf%oftfBfbfN f{[fh,Æ[AELSA MULTIman Windowsfhf%ofCfo,Æ,²fCf“fXfg[f<,³,é,Ä,ç,ê,Î[A,±,±

,Åf,fjf^ ,ì[±[~ ,Æ^É‘u,ðŽw‘è,·,é,±,Æ,²,Å,«,Ü,·[B

“^ê,lfOf%oftfBfbfN f,[]fh,ÅA“^,¶—e—
Ê,lf[]f,fŠ,đŽ[],Á,½A““™,ìELSAf{[]fh,afCf“fXfg[]f<,³,ê,Ä,ç,ê,îA[]Å—
Ç,ìE<%oÊ,đ“¾,é,±,Æ,ª,Å,«,Ü,·B

[fEfBf“fhfE[]\$CEä](f}f<f`fXfNfŠ[][f“,ì,Ý)
f}f<f`fXfNfŠ[][f“,đŽg—p,μ,Ä,ç,Åxf_fCfAf[]fO fEfBf“fhfE,đf,fj^,ì<«ŠE,É•\Ž!,μ,½,-
,É,ç[]ê[]#[]A,±,ê,đ,đfAfNfefBfu,É,μ,Ä,,¾,³,çB

fOf%oftfBfbfN f, [fh, i C³ AfJf%o [[["x/%ođ'œ" x/f^fCf~f"fO, i'² @

•K—v, Èfjf%o [[["x A%ođ'œ" x AfŠftfCfbfVf... fC [[fg, đ "ü—í, , é, é, ±, Æ, Å, f, jf^
f^fCf~f"fO, a [[[[, ³, ê, Ü, , B, ±, lf^fCf~f"fO, l [[V, μ, ç fOf%oftfBfbfN
f, [[fh, Æ, μ, Å • Ú' [[, Å, «, Ü, , B

, » , ê, É, í Af, jf^ , Å Žg—p, Å, «, é [[Å' a [[... • ½'— [[, Žü" g [[] (kHz), a • a, ©, Å, Å, ç, é, ±
, Æ, a • K—v, Å, (f, jf^ ff [[f^, iC^'è ŽQ [[Æ) [[B

, Ü, , , í • K—v, Èfjf%o [[[["x (' Ê í [[A8 bpp = 256 [[F), đ 'l' đ, μ, Ü, , B fJf%o [[[["x, a' a, «, -
, È, é, Æ [[A [[Å' a fsfNfZf< fNf [[fbN, í Ž © " @ "l, É C , , è, Ü, , B • K—v, È
%ođ'œ" x, đ'² [[@ , μ, Ü, , B %ođ'œ" x, í Af, jf^ ftfCfY, a 15", l, Æ, «, í 800 x
600 [[A16", ©, ç 18", l, Æ, «, í 1024 x 768 [[A19" ^ Ê [[ä, l, Æ, «, í 1280 x 1024, a ^ ê " Ê "l, Å, , B

•K—v, ÈfŠftfCfbfVf... fC [[fg, đ Hz, Å "ü—í, μ, Ü, , B
"wCei, l, Ü, Æ, ñ, Ç, a [[•, lfAfvfŠfP [[fvff" , i [[ê [[# [[A60 Hz, Å [[\
•a, Å, , B Windows, È, Ç "wCei, l—¾, é, ç AfvfvfŠfP [[fvff" , í [[AfffBfXfvfCfC, l, ç, Å, «, đ-
h, @, ½, ß, É [[Å' á 75 Hz ^ Ê [[ä, Å ŽÀ [[s, μ, Å, , ¾, ³, ç [[B' Ê [[í [[A [[Å "K, ÈfŠftfCfbfVf...
fC [[fg, l 85 Hz, Å, , B 100 Hz, đ %o z, l, Å, à—Ú, É C © , l, ½ %o ü ' P, a, É, ç, l, a • [[' Ê, Å, , B

fefXfg fpf^ [[f" , a ^ À ' è, μ, ½, ç [[A, Ü, , [[Ý ' è " à—
e, đ • Ú' [[, μ [[A Windows, đ [[Å < N " @ , μ, Å, ©, ç [[AfffBfXfvfCfC, lfTfCfY, Æ ^ Ê ' u, l'² [[@ , đ Ž n
, ß, Ü, , B
fffBfXfvfCfC, lfTfCfY, Æ ^ Ê ' u, đ f, jf^ , Å'² [[@ , μ, Å, Ý, Ä, , ¾, ³, ç [[B, x, Ü, , ç
, ©, È, ç [[ê [[#, í [[A [[WINman (ELSA [[Ý ' è)], Å f, jf^ f^fCf~f"fO, đ'² [[@ , , é, ±
, Æ, à, Å, «, Ü, , B

fefXfg fXfNfŠ[f“

WINman (ELSA[Ý'è),Å,í[A[V,μ,ϕf,fjf^
f^fCf~f“fO,ª•Ů'¶,³,ê,é'O,É[A[V,μ,ϕf^fCf~f“fO,ªf,fjf^,É“K,μ,Ä,ϕ,é,©,Ç,κ
,©,ªf`fFfbfN,³,ê,Ü,·B
,» ,ì,½,β,É[A,í, ,©,ÈŽžŠÔ,Å,·,ªfefXfg fXfNfŠ[f“,ª•\Ž|,³,ê,Ü,·B
fefXfg fXfNfŠ[f“,ª•\Ž|,³,ê,Ä,à[AfGfXfP[fv fL[(Esc),ð%oŸ,·,±,Æ,Å,ϕ
,Ä,Å,à[A,·,±,Æ,ª,Å,« ,Ü,·B
ŽŸ,É[AfefXfg fpf^ [f“,É-â'è,ª,È,ϕ,©,Ç,κ,©[q,È,ç,ê,Ü,·B

fefXfg fpf^ [f“,ª^À'è,μ,½,ç[A,Ü, ,Ý'è“à—
e,ð•Ů'¶,μ[AWindows,ð[A<N“® ,μ,Ä,©,ç[AffBfXfvfÇfC,ìfTfCfY,Æ^Ê'u,ì²[®,ðŽn
,β,Ü,·B
fffBfXfvfÇfC,ìfTfCfY,Æ^Ê'u,ðf,fjf^,Å²[®,μ,Ä,Ý,Ä,,¾,³,ϕ[B,κ,Ü,,ϕ
,©,É,ϕ[ê[‡,í[A[WINman (ELSA[Ý'è)],Åf,fjf^ f^fCf~f“fO,ð²[®,·,é,±
,Æ,à,Å,« ,Ü,·B

fOf%oftfBfbfN f, [fh(frfffif, [fh) Af, fjj^ f^fCf~f"fo

fOf%oftfBfbfN f, [fh(,Ü,½,Írfffif, [fh), íA, ,éff%o[[["x[A%oð'œ"x[Af, fjj^ f^fCf~f"fo[A,»,'¼,·,×,Ä,ì" ® [if, [fh,ÉŠÖ~A,·,éfefNfjjf< ff[f^,ð<L[q,·,éff[f^ fZfbfg,Å,·B

f, fjj^ f^fCf~f"fo, íA, fjj^ M+t, îêžž" ® [i, ð'è<` ,·, éff[f^ fZfbfg, Å, ·B
Šî-{"I,É,ÍfsfNfZf< fNf[fbfN[A...·½'-[. Žü" g" Af f€ [f€, ÍŠtf€fbfVf...
f€ [fg, Å, ·B
[...·½[,'¼·\Ž; ŽžŠÔ[A'O·"f|[f` [A" Šúpf<fX(Sync) ACEã·"f|[f` ,Æ,ç,æ¾—
t,Å,æ,è³Šm,É<L[q,³,ê,Ü,·B
·\Ž; ŽžŠÔ,Æ,í[A"dŽqfr[f€,ª%œ-É,ÉfsfNfZf<,ð·`%œ,·,éžžŠÔ,ì,±
,Æ,Å,·B,»,[€ã[A"dŽqfr[f€,ðÅ%o,îÊ'u,É-ß,·,É,Í, ,éžžŠÔ,ð—v,µ,Ü,·B,±,lfuf
%of"fNŽžŠÔ,í[A'O·"f|[f` (·\
Ž; ŽžŠÔ,ª[í,í,Ä,Ä,©,ç"Šúpf<fX,ªŽn,Ü,é,Ü,Å,ìžžŠÔ)[A"Šúpf<fX("Šúpf<fX,ìž'
±ŠúŠÔ)[A, ,æ,Ń€ã·"f|[f` ("Šúpf<fX,ª[í,í,Ä,Ä,©,çŽŸ,ì·\
Ž; ŽžŠÔ,ªŽn,Ü,é,Ü,Å,ìžžŠÔ),Å[¬-³,ê,Ü,·B,±,ê,í...·½[,'¼—
¼·û,íf^fCf~f"fo,É,Ä,ç,Ä" —l,Å,·B

fbf%o[["x/ bpp

fbf%o[["x, à'è'P^Ê, íbpp, ©A[F, à" , Å, ·B
 bpp (Bits Per Pixel), ÍŠefsfNfZf<, ÉŽg—p, Å, «, éfrfffl f[f, fŠ, à—e—Ê, Å, ·B, ½, Æ, à, àA8
 bpp, àê[†AŠefsfNfZf<, à8frfbfg, ðŽg—p, µA256 (= 2, à8æ)F, ðŠi" [A·\
 Ž!, Å, «, Ü, ·B
 , ±, à" , àA(%æ—Êã, à·\Ž!, É·à, ÈsfNfZf<, à, , éê[†)"—Žž, É·\Ž!, Å, «, éF, à" , à, ±
 , Æ, Å, ·B

Windows, àê[†A'ÊíA256F(= 8 bpp), àŽg—p, à, è, Ü, ·B256F, àA·\
 Ž!, à'‰ŽÀ"x, Æf[f, fŠA"i/·\Ž!—"x, Æ, àŠÖEW, ÅÅ—
 Ç, à'Ã<" , ¾, ©, ç, Å, ·B[F, à"Z, à, à" , à, à'á, ç, ÆA'œŽ, à'á‰, µA'½, -
 , àê[†AfffBfUfŠf"fo, à·K—v, É, È, è, Ü, ·B[F, à"Z, à, à" , à, à, , ç
 , ÆA[Af[f, fŠ, àA"i, à" , à, àA'Êí, àWindows fhf%ofCfo, à—"x, à'x, , È, èA‰ð'œ"x, ð
 ‰, °, é, ©A"—, à‰ð'œ"x, Å, àŠftfÆfbfVf... fÆ[f, g, ð‰, °, È, ç, Æ·\Ž!, Å, «, È, -
 , È, è, Ü, ·B
 ^è"Ê"à, É, àŽŸ, àŸ'è, ð, , µ, Ü, ·B
 'Éí, àfiftfBfX fAfvfŠfP[fVf†", É, à 256F(8 bpp)
 frfffl, Ü, ½, à3-DfAfvfŠfP[fVf†", É, à 32768, Ü, ½, à65536F(15, Ü, ½, à16 bpp), àŠfAf<ffj
 %o[
 [,"x, È‰æ'œ^—, É, à 1670—œF(24, Ü, ½, à32 bpp), àfgf<[fbf%o[

^è"Ê"à, Èfbf%o[["x

F, à"	bpp, Å·\ , à, µ, ½fbf %o[["	fRf[f"fg
-	-	---
2	1	"[·A[Af, fmfNf[
16	4	VGA 640x480, È, Ç, àpfÆfbf g
256	8	fpfÆfbfgA^è"Ê"à, È , ‰ð'œ"xfof ‰ftfBfbfN f{[fh, à·W[Æf, [fh
32768	15	fŠfAf<ffj%o[5 + 5 + 5 bpg
65536	16	fŠfAf<ffj%o[5 + 6 + 5 bpg
1670—œ	24, Ü, ½, à 32	Äf<[fbf%o[8 + 8 + 8 bpg

4, Ü, ½, Í 8 bpp, ìê#A F, ì", ÌpfCEfbfg (RAM DAC fff% [fe [fuf <), đŽg, Á, Ä • \
Ž, ³, ê, éŽÀ Û, ì F, É • ĨŠ, ³, ê, Ü, · B, ±, ÌpfCEfbfg, Å A262144 F, ÌGf "fgfŠ (6
bpp, ìê#), â 1670-œ F, ÌGf "fgfŠ (8 bpp, ìê#), ð% Å "\, Å, · B

bpp, Æ bpp, đ - " - , μ, È, ç, æ, π, É, μ, Ä, , ¾, ³, ç Bbpp, Í ARGB F • ð " z, ², Æ, Ìff
% [[[" x, đŽ, μ, Ü, · (bpp = Bits Per Gun) B, ½, Æ, Ì, Î A16 bppfŠfAf < fff% [, ìê# A5
+ 6 + 5 bpp, Í 3 F • ð " z, Ì Ô A - Î A Â, ÉŽg - p, Å, «, éfrfbfg " , Å, · B

fXfNfŠ[f“ fTfCfY[A%oÅŽ</fo[f`fff< fXfNfŠ[f“ ,i%ođ‘œ“x

fXfNfŠ[f“ fTfCfY

f,fjf^ fTfCfY,l'l,Í%oA<ÉüŠÇ(CRT),l'ÍŠpü,ìCEölfTfCfY,Å,·B%oÅŽ<•Ž|—
l^æ,l'ÍŠpüfTfCfY,æ,è,à,µ'â,«,É'l,Å,·B^ê"É"l,È'l,ÍŽÿ,l•\,l,Æ," ,è,Å,·B

ÍŠpü,ì	ÍŠpü,ì	,, ,æ,»	^ê"É"l,È
CEölfTf	CEölfTf	,ì	%ođ‘œ“x
CfY(inch)	CfY(cm)	%oÅŽ<—	l^æ(cm)
14"	35,5	27 x 20	800 x 600
17"	43	32 x 24	1024 x 768
20"	51	38 x 29	1280 x 1024

u"v,ÍfCf"f A1 inch = 2.54 cmB

%oÅŽ<%ođ‘œ“x

%ođ‘œ“x,Æ,íA•Ž|,Å,«,éfsfNfZf<“,l,±,Æ,Å,·B,½,Æ,l,ÍA1024 x 768,ìè#A...•½,ìSeqs,É 1024fsfNfZf<,ª•Ž|,³,êA,¼,ìSe—ñ,É768fsfNfZf<,ª•Ž|,³,ê,Ü,·B,µ,½,ª,Á,Ä%oæ-Êã,l'fsfNfZf<“,l1024 x 768 = 786432,É,È,è,Ü,·B

ÉíA13",Ü,Å,l,f,fjf^ ,l%ođ‘œ“x,Í 640 x 480,ÉA14",©,ç15",l,f,fjf^ ,l%ođ‘œ“x,Í800 x 600,ÉA16",©,ç 18",l,f,fjf^ ,l%ođ‘œ“x,Í1024 x 768,ÉA19"Êã,l,f,fjf^ ,l%ođ‘œ“x,Í1280 x 1024,ÉfZfbfg,³,ê,Ü,·B,½,¾,µAÅ, %ođ‘œ“x,lfhfbfg fsfbf` fTfCfY,âÅ'â...•½'-,Žü"q",É,Ç,l—v^ö,É,æ,Å,Å^Ü,È,è,Ü,·B

%ođ‘œ“x,Í dpi (Dot Per Inch),Å,à•Ž|,Å,«,Ü,·B

fo[f`fff<%ođ‘œ“x(fXfNfŠ[f“ ,lfpf“)

fo[f`fff< fXfNfŠ[f“ ,ªfAfnfefBfu,É,È,Á,Ä,ç,é,ÆAWindows,ìì<Æ—l^æ,l•Ž|,³,ê,Å,ç,é%oÅŽ<fXfNfŠ[f“ ,æ,è,à'â,«,É,è,Ü,·(,Å,Ü,èAfo[f`fff<%ođ‘œ“x,Í%oÅŽ<%ođ‘œ“x,æ,è,à'â,«,É,é)B%oB,è,½—l^æ,íAf}fEfX fj[f]f<,ªfXfNfŠ[f“ ,l<«ŠE,É—^,é,ÆCE©,l,é,æ,ª,É,È,è,Ü,·B,» ,ìEã%oÅŽ<fXfNfŠ[f“ ,l"à—e,ªfXfNf[f<,³,ê,Ü,·B,±,l"®ì,ð,Åufpf“v,Æ,àCE¾,ç,Ü,·B

fsfNfZf< fNf[]bfN/MHz

fsfNfZf< fNf[]bfN, Ü, ½, ÍsfNfZf< fCE[]fg, íMHz(f[]fKfwf<fc), Å•\, í, ³, ê, Ü, ·[]B, ±, ì'ì, ì"í^í, í'Ê[]í10, ©, ç250 MHz, Å, ·[]B, ½, Æ, ì, î[]A75 Hz, Å, ì%øđ'œ"x 1024 x 768, É, í[]A79 MHz, ìsfNfZf< fNf[]bfN, ð•K—v, Å, ·[]BfsfNfZf< fNf[]bfN, ì'ì, í[]A1•b, É[]', <[]ž, Ü, ê, ésfNfZf<[]", ð•S-œ'P^É, ÅŽì, μ, Ü, ·[]B

□...•½'-□,Žü"g□"/kHz

□...•½'-□,Žü"g□"□A,·,È,í,ž□A•ÎĚüŽü"g□",ì'è'è'P^Ê,í kHz,Å,·□B,±,ì'l,ì"í^í,í'Ê□í
30,©,ç110 kHz,Å,·□B,½,Æ,ì,î□A75 Hz,Å,ì%øđ'œ"x 1024 x 768,ìê□#□A60 kHz,ì...
•½'-□,Žü"g□",^a•K—v,Å,·□B,±,ì'l,í□AfsfNfZf< f
%øfCf",^a□',«□ž,Ü,è,é'¬,³□A,Å,Ü,è□A"dŽqfr□[f€,^a%øA<É□üŠÇ,ì't,đ-^•b%ø½□ç
%øñ□¶,©,ç%øE,É"®,,ì,©,đŽ!,μ,Ü,·□B

fŠftfÆfbfVf... fÆ[fg/Hz

ftfÆ[fÆ fŠftfÆfbfVf...

fÆ[fg, ·, È, í, ç, '¼•ÎĈüŽü"g", ì'â'è'P^Ê, íĀHz, Å, ·B'ÊíĀ'í, ì"í'í, í60, ©, ç100 Hz, Å, ·BHz, Æ, íHertz(fwf<fc), ì—ªĈê, Å, ·B75 Hz, È, çĀA-^•b 75, ìftfÆ[fÆ,ª•\ Žì,ª,è,é,Æ,ç,±,Æ,Å,·B

"wĈei, ì, Û, Æ, ñ, Ç,ª•, ìfAfvfŠfP[fVf†f", ìĕê†Ā60 Hz, Å\ª, Å, ·B, æ, è" wĈei, ì-¾, é, ç Windows, ì, æ, ±, ÈfAfvfŠfP[fVf†f", ìĕê†Ā, ç, ç, Å, «, ð-hŽ~ , ·, é, ½, ß, ÈĀĀ'á75 Hz^Êĕă, ÅŽĀs, µ, Å,¾,ª, çĀB'ÊíĀĀ"K, ÈfŠftfÆfbfVf... fÆ[fg, í85 Hz, Å, ·BfŠftfÆfbfVf... fÆ[fg,ª100 Hz, ð%oz, ì, Å, à-Ú, ÅSm" F, Å, «, é%ü'P, ì, ·, è, Û,ª, ñĀB

'Êí, ìfmf"fCf"f^ [fÆ[fX"®Ā, Å, íĀftfÆ[fÆ, ìfŠftfÆfbfVf... fÆ[fg, ì, '¼•ÎĈüŽü"g", Æ"- , Ā, ·B 'á...•½'-Ā, Žü"g", Å, àĀ, fŠftfÆfbfVf... fÆ[fg, ð^óĀŮ•t, ·, é, ½, ß, ÈfCf"f^ [fÆ[fX fffBfXfvfÆfC,ª%ß<Ž, È, æ, —p, ç, è, Û, µ, ½ĀB, ±, ìf, [fh, Å, íĀŠeftfÆ[fÆ,ª2•ªŠ,,,ª, è, Û, ·BĀĀ%ü, ì"¼•ª, ìftfÆ[fÆ, Å<ĕ" f%ofCf",ª•`%œ,ª, èĀ1f%ofCf"fV•ªfvftfg, µ, ÅŠiĀ", ìf%ofCf",ª•`%œ,ª, è, Û, ·B, µ, ½,ª, Á, Ā, '¼•ÎĈüŽü"g", ìftfÆ[fÆ fŠftfÆfbfVf... fÆ[fg, ì" {, È, È, è, Û, ·B , ±, ì•\ŽìŽè-@, íĀfēfÆfr, ÈŽg, í, è, Ā, ç, ĀĀIBM 8514/A frfffi fAf_fvf^, È, àĀ—p,ª, è, Ā, ç, Û, ·B , ½,¾, µĀA•\Žì•î^Ê,ª, ç, ì, ìfmf"fCf"f^ [fÆ[fX f, [fh, ì•û, Å, ·B

ftfÆ[fÆ fŠftfÆfbfVf... fÆ[fg, ìf, fjf^, ðĀİŜÔĀHŠw"í, ÈĈ©, ½ĕê†ĀĀd—v, Å, ·B75 Hz, ð%œ%œñ, èfŠftfÆfbfVf... fÆ[fg, âĀfCf"f^ [fÆ[fX, ìŽg—p, íĀİŜÔĀHŠw"í, ÈĀD, Û, µ, ·, È, ç, Æ,ª, è, Ā, ç, Û, ·B , à, ç, è, ñĀİŜÔĀHŠw"í, È, íĀA•úŽĔĀü,ªĀ, È, ç, ±, Æ, âĀf, fjf^ fTfCfY, ·, æ, Ñfhfbfg fsfbf` , È"K, µ, ½%œđ'œ"x, È, Ç, ì"ÁĀ«, àĀ—Ā,ª, è, Û, ·B

f}f<f`fXfNfŠ[]f“(MULTIman)

fRf“fsf...[]f^,É ELSA MULTIman Windows fhf%ofCfo,afCf“fXfg[]f<,³,ê,Ä,ç
,ê,î[]AWindows,đ‘½fXfNfŠ[]f“(f}f<f`fXfNfŠ[]f”),ÅŽg,κ,±,Æ,ª,Å,«,Ü,·[]BfRf“fsf...
[]f^,É,ÍELSA fOf%oftfBfbfN f{[]fh,ª 1-‡^È[]ãfCf“fXfg[]f<,³,ê,Ä,ç
,È,¯,ê,î,È,è,Ü,¹,ň[]B,½,¾,µ‘¼,lf{[]fh,Æ”C^Ó,É‘g,Ý[]‡,í,ª,Å,«,é,í,¯,Å,í, ,è,Ü,¹,ň[]BŽ
w’è,³,ê,½‘g,Ý[]‡,í,¹^ÈŠO,ÍŽg,|,Ü,¹,ň[]B“^ê,lfOf%oftfBfbfN f,[]fh,Å[]A“¯,¶—e—
Ê,lf[]f,fŠ,đŽ[],Á,½[]A““™,ìELSAf{[]fh,afCf“fXfg[]f<,³,ê,Ä,ç,ê,î[]A[]Å—
Ç,ìC<%oÊ,đ“¾,é,±,Æ,ª,Å,«,Ü,·[]B

ftfHf“fg fTfCfY

Windows, ÅŽg—p, ., éftfHf“fg fTfCfY, í²□@%oÂ“\, Å, .□BftfHf“fg
fTfCfY, í□A800x600, Ü, Å, ì%ođ‘œ“x, Å, í 96dpi (□→)□A1024x768^È□ã, ì%ođ‘œ“x, Å, í
120dpi (‘â),^â•□’ÊŽg—p,³ê, Ü, .□B

f, fff^ ff[f^, iCE^è

ELSA fOf%oftfBfbfN

f{[fh, ðf, fff^, É“K[±, ³, ¹, é, É, í[Af, fff^“ ®[ì, ìff[f^, Æ”í^í, ðCE^è, ·, é, ±, Æ, º•K—
v, Å, ·[B
, ±, ±, Å, í[Af, fff^, ì[Å^â[... •½’- [, Žü”g[” (kHz), º“Á, É[d—v, Å, ·[B, ±
, ì[ãCEÀ, ð’ , , é, Æ[A[Å^« , ì[ê[±f, fff^, ÉCE[á, ð—^ , ·, ±, Æ, º, , è, Ü, ·[B

f, fff^, ìf[ff][f][Af, fff^, ì<@Ží-¼

’É[í[Af[ff][f][, , æ, ÑCE^-¼, ìf, fff^, ì”w-É, É, , è, Ü, ·, º[A, È, ç[ê[±, ìf, fff^ f}ffj...
fAf<, ðŽQ[Æ, µ, Å, , ¾, ³, ç[B

CEö[ff, fff^ ftfCfY

f, fff^ ftfCfY, ì’l, í[A%oA<É[üŠÇ(CRT), ì’ÍSp[ü, ìCEö[ftfCfY, Å, ·[B, ±, é, í[A%oAŽ<•\
Ž!—l^æ, ì’ÍSp[ü, ìftfCfY, æ, è, à[, µ’â, «, È’l, Å, ·[B^ê”É”l, È’l, í[A14” (35.5 cm)[A17”
(43 cm) [A, Ü, ½, ì20” (51 cm), Å, ·[B<L[+u”[v, ìfCf”f^ (2.54 cm), ð•\, µ, Ü, ·[B

[... •½’- [, Žü”g[” , ì”í^í(kHz)[A
[, ¼fŠftfCEfbfVf... fCE[fg, ì”í^í(Hz)

[Å^â, , æ, Ñ[Å^á, ì[... •½’- [, Žü”g[” , ÆfŠftfCEfbfVf... fCE[fg, í[A, “Žè<- , ìf, fff^
f}ffj... fAf<, É<L[Ü, ³, é, Å, ç, Ü, ·[B
, ±, ±, Å, í[Af, fff^, ì[Å^â[... •½’- [, Žü”g[” (kHz), º“Á, É[d—v, Å, ·[B, ±
, ì[ãCEÀ, ð’ , , é, Æ[A[Å^« , ì[ê[±f, fff^, ÉCE[á, ð—^ , ·, ±, Æ, º, , è, Ü, ·[B, » , ì¼, ì’l, ºCE^ ,
Ü, ç, É, ç[ê[±[Af[f[, ì, Ü, Ü, É, µ, Å, , ç, Å, ©, Ü, ç, Ü, ¹, ñ[B

f, fff^, ìfvf[fpfefB, iCE^è

f, fff^, ìfvf[fpfefB, ðCE^è, ·, é, É, í[AŽŸ, ÉŽ! , , ç, , Å, ©, ì•û-@, º, , è, Ü, ·[B

f, fff^ f}ffj... fAf<:

f, fff^, ì<Z[pZd—l, í[Af, fff^, É•t’® , , éf}ffj... fAf<, É<L[Ü, ³, é, Å, ç, Ü, ·[B

VESA DDC:

f, fff^, ÉVESA DDC fRfIfNf^, º’•”ð, ³, é[AfOf%oftfBfbfN f{[fh, º VESA DDC
CEŸŠ , ì[ê[±[Af, fff^ ff[f^ , ìf, fff^ fP[ffuf<, ð%oî, µ, ÅfOf%oftfBfbfN
f{[fh, ÉŽ©“®“l, É’—[M, ³, é, Ü, ·[B

VESA VDIF f, fff^<L[qftf@fCf<(*.VDA):

f, fff^, ÉVESA VDIF f, fff^<L[qftf@fCf<(*.VDA), º“Y•t, ³, é, Å, ç, é[ê[±[A•K—
v, Éff[f^, ì, ±, é, ©, ç“Ç, Ý[ž, Ü, è, Ü, ·[Bf, fff^ ff[f^, ð“ü—l, , é, Æ, «[AWINman
(ELSA[Ÿ^è), É[AVDIFftf@fCf<, ð“Ç, Ý[ž, p, ½, ß, ìf{f^f” , º•\Ž! , ³, é, Ü, ·[B

ELSA f,fjf^<L□qftf@fCf<WINman.MON:

ELSA f,fjf^<L□qftf@fCf<WINman.MON,ÉŽg—p,·,éf,fjf^,ª<“,ª,Á,Ä,ç,ê,î□A,»,±
,©,çf,fjf^ ff□lf^,ªŽæ“¾,³,ê,Ü,·□B,±,ê,í□Af,fjf^ ff□lf^“ü—
í,ì□Ü,Éf,fjf^,lf□□lf□□,Æ<@Ží-¼,đ'l'đ,·,é,±,Æ,ÅŽ©“®“l,É□s,í,ê,Ü,·□B

f, fĵf^ f}fĵf...fAf<

ELSA fOf%oftfBfbfN

f{ [fh, ðf, fĵf^, ÉĀ“K, Èó‘Ô, Ā“Kĵ, 3, 1, é, ½, ß, ÉĀŽŸ, ÉŽ!, ·ff [f^, ðf, fĵf^, ĺ}fĵf...
fAf<, Ā‘T, μ, Ā,, ¾, 3, çB

f, fĵf^ f [f] [Af, fĵf^, ĺ@Ží-¼ AfCf“f^, Ü, ½, ĺfZf“f ‘P^Ê, ĺ‘ĪŠpü, ĺĒö ĺf, fĵf^
fTfCfY (=

fCf“f^, Ü, ½, ĺfZf“f ‘P^Ê, ĺCRT, ĺ‘ĪŠpü fTfCfY) ĺkHz‘P^Ê, ĺĀ‘á, ,, æ, ÑĀ‘â ĺ... ·½’-
ĺ, Žü”gĺ” (= ĺ... ·½·ĺĒüŽü”gĺ” = ‘-

ĺ, fĒĺ [fg) ĺAHz‘P^Ê, ĺĀ‘á, ,, æ, ÑĀ‘â, ‘¼ftfĒĺ [fĒfŠftfĒfbfVf... fĒĺ [fg(=
ĺ, ‘¼·ĺĒüŽü”gĺ”) ĺB

, ±, ±, Ā, ĺ Af, fĵf^, ĺ<—eĀ‘â ĺ... ·½’-ĺ, Žü”gĺ” (kHz), a“Á, ÉĒd—v, Ā, ·ĺB, ±,
ĺ, ĺăĒĒ, ð’ , ĺ, é, ĒĒĀĀ^«, ĺĒĒĵf, fĵf^, ÉĒĒĒá, ð—^ , , ±, Ē, a, , è, Ü, ·ĺB

WINman.MON

ELSA f,fjf^<L□qftf@fCf<WINman.MON,ÉŽg—p,·,éf,fjf^,ª<“,ª,Á,Ä,ç,ê,î□A,»,±
,©,ç“®□ì”í^í,ª•ª,©,è,Ü,·□B,±,ìftf@fCf<,É,í□Af|fsf...f
%o□[,Èf,fjf^,ìŽâ,È“Á□«,Æ□\$CEÀ,ª<L%o¯,³,ê,Á,ç,Ü,·□B

,±,ìASCIIfefLfXfg ftf@fCf<,É,íf,fjf^,ìff□[f^,ª<L□q,³,ê,Ä,ç
,Ü,·□B,»,ì<L□q,ìfGf“fgfŠ,ìŽŸ,ì,Æ,“,è,Å,·□B
f,fjf^,ìf□□[fj□[□Af,fjf^,ì<@Ží-¼□AfCf“f’P^Ê,ìîŠp□ü,ìCEö□ìf,fjf^
fTfCfY□AkHHz’P^Ê,ì□Á’á,“,æ,Ñ□Á’â□...•½’-
□,Žü”g□”□AHHz’P^Ê,ì□Á’á,“,æ,Ñ□Á’â□,’¼ftfCE□[f€ fŠftfCEfbfVf...
fCE□[fg□Af~fŠ’P^Ê,ìfsfNfZf< fTfCfY/fhfbfhg fsfbf` □B

,±,ìftf@fCf<,Á,íf,fjf^,ì<L□q,í—á,!,ìŽŸ,ì,æ,α,É,È,è,Ü,·□B
LSA, GDM-17E40, 17", 29-82kHz, 50-150Hz, 0.26mm

VESA VDI f, fff^ < L qftf @ fCf <

VDIF, íf, fff^ Žd—l, ð < L q, , é, ½, ß, ìftf @ fCf < Ě Ž ®, ð'è < , , é VESA
< KŠi, Ā, . BVDIFftf @ fCf <, É, Í % œ—Ě, Ì Í Šp üftfCfY, È, Ç, ìf, fff^ “Ā < , â A Ā'â < —e...
• ½'—, Žü”g” (kHz), È, Ç, ìf, fff^, Ì “ ®” í Ā, É, Ā, ç
, Ā, ìff [f^, ā ŠÜ, Ü, ê A, » , Ì [PREADJUSTED_TIMING], ìfZfNfVf#f” , É, Í ŠY—
, , éf, fff^ , É “K, μ, ½f, fff^ f^fCf~f”fO, É, Ā, ç, Ā, ìff [f^ fZfbfg, ā < L q, ³, ê, Ā, ç, Ü, . B

VDIFftf @ fCf <, ð Žg—p, , é, Ā Af, fff^ ff [f^, Ì · Ū ‘ ħ A ^ ø “n, μ A Ā—~—p, ā, Ā, «, Ü, . B

*. VDA VDI f, í ASCIIftf @ fCf <, È, Ì, Ā A · W € , ìfefLfXfg
fGffBf^ , ð Žg, Ā, Ā ĩ—, , æ, N C ³, , é, ±, Ā, ā, Ā, «, Ü, . B
*. VDB VDI f, ìfofCfifŠ fR [fh ftf @ fCf <, È, Ì, Ā A “Ā Ž ê, È f\ftfgfE fFfA, ¾, , Ā Žg—
p, ³, ê, Ü, . B
WINman (ELSA ħ'è), Í *. VDA
VDIFftf @ fCf <, Ì “Ç, Ÿ Ž æ, è, Ā ħ , « ħ Ž, Ÿ, ā, Ā, «, Ü, . B WINman, āftf @ fCf <, ð ħ , « ħ Ž, p, Ā, «, Í
A WINman, É Š Ö Ě W, , é ħ €—
Ū, ¾, , ā < L “ü, ³, ê, Ü, . B WINman, Ā ĩ—, ³, ê, ½ftf @ fCf <, ð ¼, ìf\ftfgfE fFfA, ā Žg—
p, , é ħ ħ # A u = ħ v < L ħ , Ì % E, Ì ó—“ , É A · s' « , μ, ½ ħ ĩ · ñ, ðfefLfXfg
fGffBf^ , ð Žg, Ā, Ā < L “ü, , é, ±, Ā, ā · K—v, Ā, . B

*. VDA VDI f, í A Ž Ÿ, É Ž Ĩ , , ç , Ā, © , ìfZfNfVf#f” , Ā ĩ—, ³, ê, Ā, ç, Ü, . B

[VERSION]

VESA < KŠi, ìfo [fWf#f”” Ō ħ ħ B

[MONITOR_DESCRIPTION]:

Manufacturer = f, fff^ f [f] [A ModelNumber = f, fff^ , Ì @ Ž Ĩ—¼ A CRTSize = % œ—
Ě, Ì Í Šp üftfCfY, È, Ç, Ì è “Ē Ĩ, È f, fff^ < L q ħ B

[OPERATIONAL_LIMITS]:

MinHorFrequency = Ā'á... • ½'—, Žü”g” A MaxHorFrequency = Ā'á... • ½'—
, Žü”g” A MinVerFrequency = Ā'á, ¼ Šftf ĒfbfVf... f Ē [fg A MaxVerFrequency
= Ā'á, ¼ Šftf ĒfbfVf... f Ē [fg, È, Ç, ìf, fff^, Ì “ ®” í Ā ħ B

[PREADJUSTED_TIMING]:

PreadjustedTimingName = f^fCf~f”fO—¼ A HorPixel/VerPixel = X/Y · Ū Ē ü, Ì
% œ’œ “x A HorFrequency = ... • ½'—, Žü”g” A VerFrequency =
, ¼ Šftf ĒfbfVf... f Ē [fg A PixelClock = fsfNfZf < fNf ħfbfN f Ē [fg A TotalTime =
Ž Ž Š Ō ħ Ē Ē v A AddrTime = · Ž Ĩ Ž Ž Š Ō A BlankStart = · Ž Ĩ, ā Ž n, Ü, Ā, Ā, © , ç fuf
% of “fLf”fO, ā Ž n, Ü, é, Ü, Ā, Ì Ž Ž Š Ō A BlankTime = fuf % of “fLf”fO Ž Ž Š Ō A AsyncStart = · \
Ž Ĩ, ā Ž n, Ü, Ā, Ā, © , ç “Š úpf < fX, ā Ž n, Ü, é, Ü, Ā, Ì Ž Ž Š Ō A AsyncTime =
“Š úpf < fX, Ì Ž ħ ± Š ú Š Ō, È, Ç, ìf, fff^ f^fCf~f”fO, ìff [f^ fZfbfg ħ B

VESA VDIF f,fjf^<L□qftf@fCf<,ì“Ç,ÝŽæ,è

ELSA fOf%oftfBfbfN

f{□[fh,ðf,fjf^,É“K□‡,^{3,1},é,^{1/2},ß,É□Af,fjf^“@□ì,ìff□[f^,Æ”í^í,ðCE^è,·,é,±,Æ,^a•K—
v,Å,·□BŽg—pf,fjf^,ÉŠY“—,·,éVESA VDIFf,fjf^<L□qftf@fCf<(*.VDA)
,^a,,è,í□A,»),ìftf@fCf<,ðŽg—p,μ,Ä,,^{3/4,3},ç□B,»,ì^{1/4},ì•û-@,í□Af,fjf^
ff□[f^,ìCE^è,Æ,ç,αCE©□o,μ,Å□à-^{3/4,3},è,Ä,ç,Û,·□B

[WINman (ELSA□Ý^è)],ì[VESA VDIF f,fjf^<L□qftf@fCf<,ð“Ç,ÝŽæ,é]
,ìf_fCfAf□fO,Å□A,Û,·•K—v,Èffj%oo□□□[“x (’É□í□A8 bpp = 256□F),ð’l’ð,μ,Û,·□Bffj
%oo□□□[“x,^a□,ç,Æ□A’l’ð,Å,«,éf,fjf^ f^fCf~f“fO,ì’l,ÌŽ©“@“l,É□—,³,-
,É,è,Û,·□BŽÝ,É•K—v,Èf,fjf^ f^fCf~f“fO,ð’l’ð,μ,Û,·□B□Å□%oo,ì2,Ä,ì’l,íX,ÆY,ì
%ooð’œ“x (□...•^{1/2},Æ□,^{1/4},ì%ooð’œ“x),ð•\,í,μ,Û,·□B%ooð’œ“x,ìf,fjf^ fTfCfY,^a
15",Û,Å,ìf,fjf^,É,ì 800 x 600□A16",©,ç18",Û,Å,ìf,fjf^,É,ì 1024 x
768□A19"ˆÉ□ã,ìf,fjf^,É,ì 1280 x 1024,^a•□’É,Å,·□BŽÝ,ì’l,ìftfCE□[f€,ìŠftfCEfbfVf...
fCE□[fg(ftfCE□[f€/•b),ð Hz’P^É,Å•\,í,μ,Ä,ç,Û,·□B
”wCEi,ì,Û,Æ,ñ,Ç,^a□•,ìfAfvfŠfP□[fVf†f“,ì□è□‡□A60 Hz,Å□\•^a,Å,·□B,æ,è”wCEi,ì-
^{3/4},é,ç Windows ,ì,æ,α,ÈfAfvfŠfP□[fVf†f“,ì□è□‡□A,ì,ç,Ä,«,ð-
hŽ~,·,é,^{1/2},ß,É□A□Á’á75 Hz^É□ã,ÄŽÀ□s,μ,Ä,,^{3/4,3},ç□B’É□í□A□Á“K,ÈfŠftfCEfbfVf...
fCE□[fg,ì85 Hz,Å,·□BfŠftfCEfbfVf... fCE□[fg,^a100 Hz,ð%ooz,ì,Ä,à-Û,ÅŠm”F,Å,«,é
%ooü’P,ì, ,è,Û,¹,ñ□B

—
^aCEè□ui□v,“,æ,Ñ□uni□v,í□A,»,è,^{1/4},èfCf“f^□□fCE□[fX,“,æ,Ñfmf“fCf“f^□□fCE□[fX,ð
•\,í,μ,Ä,ç,Û,·□B
kHz,ì’l,í□...•^{1/2}-□,Žü”g□”,ð•\,í,μ,Û,·□B,±,è,^af,fjf^,ì□Á’á...•^{1/2}-
□,Žü”g□”,ð’l,ì,Ä,í,ç,·,Û,¹,ñ(VDIFftf@fCf<,Å’l,ì,é,±,Æ,ì, ,è,Û,¹,
ñ)□BMHz,ì’l,ìfsfNfZf< fNf□fbfN,ð•\,í,μ,Û,·□BfOf%oftfBfbfN f{□[fh,í□A,»,ìfsfNfZf<
fNf□fbfN,ð□□□—,Å,«,é,±,Æ,^a•K—v,Å,·(WINman,^af`fFfbfN,μ,Û,·)□B

f, fjjf^ f^fCf~f"fo, ð VESA VDIF ftf@fCf<, Æ, μ, Å•Û'¶, , é

[WINman (ELSA ¶Ý'è)], ìf_fCfAf¶fO[VESA VDIF f, fjjf^ <L¶qftf@fCf<, Æ, μ, Å•Û'¶]
, Å, Í¶A¶V, μ, ¶f, fjjf^ f^fCf~f"fo, ð VESA VDIF f, fjjf^ <L¶qftf@fCf<(*.VDA)
, É•Û'¶, ð, è, Ü, ¶B

, ±, ±, Å, Í¶A Windows, Í¶V, μ, ¶fOf%oftfBfbfN f, ¶[fh, É, Í¶Ø, è'Ö, í, è, Ü, ð, ñ¶B

VDIF, Í¶Af, fjjf^ "Å¶«, ð<L¶q, , é, ½, ß, ìff¶[f^Æ`Ž®, ð'è<` , , éVESA<KŠi, Å, ¶BVDIFftf@
fCf<, É, Í¶æ-É, Ì'ÍŠp¶üfTfCfY, È, Ç, ìf, fjjf^ "Å¶«, â¶A¶Å'â<-e¶... •½'-¶, Žü"g¶"(kHz)
, È, Ç, ìf, fjjf^, Ì"®¶"Í'Í, É, Å, ¶, Å, ìff¶[f^, ðSÜ, Ü, è¶A, »), Ì[PREADJUSTED_TIMING]
, ìfZfNfvf¶f", É, ÍSY"- , , éf, fjjf^, É"K, μ, ½f, fjjf^ f^fCf~f"fo, É, Å, ¶, Å, ìff¶[f^
fZfbfg, ð<L¶q, ð, è, Å, ¶, Ü, ¶B
VDIFftf@fCf<, ðŽg-p, , é, Æ¶Af, fjjf^ ff¶[f^, Ì•Û'¶¶A^ø"n, μ¶A¶Ä-~ -p, ð, Å, «, Ü, ¶B

[WINman (ELSA ¶Ý'è)], Í¶A¶V<KVDIFftf@fCf<-
p, ìfef"fvfÆ¶[fg, ð¶ì¶- , μ, Ü, ¶B WINTM, Å, Í, , x, Ä, Ì¶€-Ú, ð"ü-Í, ð, è, é, í, -, Å, È, -
¶Aftf@fCf<, ð-~ -p, , é, Ì, É¶Å"Ç, Ý¶ž, Ý, , é•K-v, Ì, , é¶€-
Ú, ¾, -, Å, ¶Bftf@fCf<, ð¼, ìfvf¶fOf%of€, ÅŽg-p, , é¶ê¶¶A¼, Ì¶€-Ú, à"ü-
Í, μ, È, -, è, Í, È, è, Ü, ð, ñ¶BfL¶[f¶[fh, ð, , é, Ì, É¶A¶u=¶v<L¶t, Ì%oE'x, ð<ó", Ì¶ó'Ô, Å, , è, Í¶
A•s'« , μ, ½¶î•ñ, ð<L'ü, μ, È, -, è, Í, È, è, Ü, ð, ñ¶B*.VDA VDIF, Í¶f¶^, È
ASCIIftf@fCf<, È, Ì, Å¶A^È¶ã, Ì¶ì<Æ, Í•W¶€, ìfefLfXfg fGfffBf^, Å¶s, Ì, Ü, ¶B
WINman, Í, , x, Ä, ìf, fjjf^
f^fCf~f"fo, É'Í, μ, Å¶V<Kftf@fCf<, ð¶ì¶- , μ, Ü, ¶B"^-^èf, fjjf^, É•í¶", ìf, fjjf^
f^fCf~f"fo, ð® , μ¶A, » , è, ç, ð, Ð, Æ, Å, È, , é¶ê¶¶AfefLfXfg
fGfffBf^, ðŽg, Å, Å¶A¼, ìftf@fCf<, Ì[PREADJUSTED_TIMING]fZfNfvf¶f", ð¶A¶%o
, ìftf@fCf<, Ì¶Í, í, è, É'Ç%oÅ, μ, È, -, è, Í, È, è, Ü, ð, ñ¶B

VDIFftf@fCf<-¼

VDIFftf@fCf<, Ì¶A¶%o, Ì 3•¶Žš, ìf, fjjf^ f¶¶[fj¶[-¼, Å¶A'±,
5, Å, Í•¶Žš, Ü, ½, Ì¶"Žš, ìf, fjjf^, Ì<@ŽÍ-¼, Å, ¶Bftf@fCf<-¼, ÌŠg'£Žq, Í.VDA, É, μ, Å, -
, ¾, ð, ¶B"ü-Í, ð, è, ½f¶fX-¼, Í¶A, Å, «, è, ìftf@fCf<[fffBfXfN, Å, È, fn¶[fh
fffBfXfN, ÉŽw'è, μ, Ü, ¶Bftf@fCf<[fffBfXfN, ÉŽw'è, , é, Æ¶A•Û'¶, É, ©, È, è', ¶žžšÔ,
ð-v, μ, Ü, ¶B

CEö¶ìf, fjjf^ ftfCfY

f, fjjf^ ftfCfY, Ì'Í, Í¶A¶%A<É¶üŠÇ(CRT), Ì'ÍŠp¶ü, ÌCEö¶[ftfCfY, Å, ¶B, ±, è, Í¶A¶%oÅŽ<•\
ŽÍ-Í'æ, Ì'ÍŠp¶üfTfCfY, æ, è, à¶, μ'â, «, È'Í, Å, ¶B^è"É"Í, È'Í, Í¶A14" (35.5 cm)¶A17" (43
cm) ¶A20" (51 cm), Å, ¶B<L¶t¶u¶v, ìfCf" f` (2.54 cm), Ì, ±, Æ, Å, ¶Bfvf¶fOf%of€, ðŽg-
p, , é, Ì, ìfCf" f` , Ì'Í, ¾, -, Å, , ð¶A, ±, Ì'Í, ðCE^, ß, é, Ì, É¶A'ÍŠp¶ü, ìftfCfY, ðfZf" f` , Å•\, í, μ, Å¶A
%oÅŽ<%oæ-É-Í'æ, ðfZf" f` , Å'è, μ, ½, Ý, Å, à, æ, ¶, Å, μ, ð, x¶B

kHz¶...½'-¶, Žü"g¶"Í'Í¶A

Hz¶, ¼fŠftfÆfbfVf... fÆ¶[fg, Ì"Í'Í
¶A'á, Æ¶A'â, Ì¶...½'-¶, Žü"g¶", ÆftfÆ¶[f€, ìfŠftfÆfbfVf... fÆ¶[fg, ìf, fjjf^ f}fjjf...

fAf<,É,à<LÚ,³,ê,Ä,ç,Û,·B
,±,±,Å,íAf,fjf^,ìÅ'â...•½'-,Žü"g"(kHz),^a“Á,Éd—v,Å,·B,±
,ìãÆÀ,ð',!,é,ÆAÅ^«,ìêf,fjf^,ÉÆìá,ð—^,·,±,Æ,^a,è,Û,·B

VESA DDC (•Ž!ff□lf^ f`fff“fif<)

f,fjf^,ªVESADDC,đfTf□□lfg,μ□Af,fjf^ fP□[fuf<,ª DDC,É“K,μ□AfOf%oftfBfbfN
f{□[fh,ªVESADDCÉYŠ·,ìê□#□Af,fjf^ ff□lf^,đfOf%oftfBfbfN f{□[fh,Éf,fjf^
fP□[fuf<,đ%oi,μ,ÄŽ©“®“l,É’—□M,Ä,«,Ü,·□B

ŽŸ,ÉŽ!,·,Æ,“,è□ADDC1□ADDC2B□ADDC2AB,Æ,ç,ª 3,Â,ì^Ù,È,Á,½<KŠi,ª, ,è,Ü,·□B

DDC1

f,fjf^ fP□[fuf<,lf%ofCf“,í□Af,fjf^,©,çfOf%oftfBfbfN,Ö’P•ûCEü,ì~A’±,μ,½ff□lf^
fXfgfS□[f€,đ’—□M,·,é,ì,ÉŽg—p,³,è,Ü,·□B•W□€,ì IBM VGACÉYŠ· 15-fsf“ f,fjf^
fRfIfNf^,ìê□#□Afsf“ 12 (^È’O□Af,fjf^ IDfrfbfg 1,Æ,μ,ÄŽg—p),Íff□lf^’—□M,ÉŽg—
p,³,è□Afsf“ 14,ì□,¼“~Šú□M□+,í’—□MfNf□fbfN(VCLK),Æ,μ,ÄŽg—
p,³,è,Ü,·□B128fofCfg,ìEDID ff□lf^ fZfbfg(Sg’£fffBfXfvfCEfCID),íCE,è•Ô,μ’—
□M,³,è□A,»,±,©,çfRf“fsf...□lf^,íŽå—v,Éf,fjf^ ff□lf^,đ“Ç,ÝŽæ,é,±
,Æ,ª,Ä,«,Ü,·□B,±,Íff□lf^,ì□\□—v’f,íA3•¶Žš,Íf□□lfj□□,ìEISA-CFG fL□□Af,fjf^
fTfCfY□ADPMSfTf□□lfg,ì”í^í□Afjf%oo□[“Á«□AfTf□lfg,³,è,Ä,ç,é VESA f,fjf^
f^fCf~f“fO,ÍfŠfXfg□A,ç,,Ä,©,ìŽ©—R,É’è<^,ì,Ä,«,é,f,fjf^ f^fCf~f“fO,È,Ç,Ä,·□B

DDC2B

12Cfvf□fgfRf<,ÉŠî,Ä,‘o•ûCEüff□lf^ f`fffif<,ª□Af,fjf^,ÆfOf%oftfBfbfN
f{□[fhSÔ,ì’É□M,ÉŽg—p,³,è,Ä,ç,Ü,·□B•W□€,ì IBM VGACÉYŠ· 15-fsf“ f,fjf^
fRfIfNf^,ìê□#□Afsf“ 12 (^È’O□Af,fjf^ IDfrfbfg 1,Æ,μ,ÄŽg—p),Íff□lf^’—□M,ÉŽg—
p,³,è(SDA)□Afsf“ 15 (^È’O□Af,fjf^ IDfrfbfg 3,Æ,μ,ÄŽg—p),í’—□MfNf□fbfN(SCL)
,Æ,μ,ÄŽg—p,³,è,Ü,·□BfOf%oftfBfbfN f{□[fh,í’Z,çEDID□î•ñ(DDC1ŽQ□Æ)
,Æ□A,æ,è•iŠ±“l,ÈVDIF□î•ñ(VESAfffBfXfvfCEfCŽ~•Éftf@fCf<),đ<ª,É—
v□,Ä,«,Ü,·□B

DDC2AB

DDC2B,ìŽŸ,ìDDC2AB,Ä,í□A%ooæ-È,ì^È’u,â-
¾,é,³,ì’²□®,È,Ç□Af,fjf^ □§CEä,ÍfRf}f“fh,đfRf“fsf...□lf^,©,ç’—□M,·,é,±
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VESA DPMS

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,É,Ç,É,æ,èŽ©“®“l,É<N“®),Å,«,Ü,·□B,±,é,ÍfL□[f{□[fh,Æf}fEfX,^a, ,é^è‘è,ìŽžŠÔŽg
—p,³,é,È,ç,Æ□Af,fjf^,đ□È“d—Íf,□[fh,É,μ,Ü,·□BfL□[,đ
%oÿ,·,©f}fEfX,đ“®),©,·,Æ□Af,fjf^,í□³í,È“®ì,É□Ø,è‘Ö,í,è,Ü,·□B

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□M,³,é,Ü,·□B
,±,Íf,□[fh,í□í,ÉfTf|□[fg,³,é,Ä,ç,é,í,~,Å,í, ,è,Ü,¹,ñ□B

fTfXfyf“fh

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OFF

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□M,³,é,Ü,·□B

fCfWfXfgfŠ,ift[fU fAfJfEf“fgC —

fCfWfXfgfŠ,Ö,ì‘,«ž,ÝC —,đŽ,Á,Ä,ç,È,ç,½,ß,É[A[OK],Ü,½,í[“K—p]f{f^f“,đ
%oÿ,µ,½Cä,É[AfOf%oftfBfbfN f,[fh,đØ,è’Ö,ì,é,±,Æ,ì,Å,«,È,çŽ,đ’m,ç,¹,éfGf
%o[f ffbfZ[fW,³o,½ê#AŽÿ,ÉŽ!,·,Æ,“,èAŞÇ—ŽÒ,É,»,ìC —,đ—v<,µ,Ä,-
³/₄,³,çB

fCfWfXfgfŠ,Å[A[HKEY_LOCAL_MACHINE]AŽÿ,É[System\CurrentControlSet\
Services\WINNER],Æi,ñ,ÅfL[,đ’ì,đ,µ,Ü,·B[Security]x[Permissions]
,đ’ì,đ,µ,ÄAf_fCfAf[fO[Registry Key Permissions],đŠ],«,Ü,·B
,±,ìfL[,É’ì,µ,ÄA•K—v,Èft[fU fOf<[fv(’ÉíAçUsers£,Ü,½,ÍçPower User£)
,ì[Registry Key Permissions],đŠg’£,µ,Ü,·B,Å,Ü,è,±,ìfOf<[fv,É’ì,µ,ÄA[Special
Access...],ì,Æ,±,è,ÅA[Query Value]A[Set Value]A[Create Subkey]A[Enumerate
Subkeys]A[Delete],ìŠefAfNfZfXC ,đ—^,!,ÄA[Type of Access]
,đC³,µ,Ü,·Bf_fCfAf[fO[Registry Key Permissions],Åf`fFfbfNf{fbfNfX[Replace
Permission on Existing Subkeys],đfAfNfefBfu,É,µ,Ü,·B

