

Optical Proximity Correction for 0.13 μm SiGe:C BiCMOS

UOI gkurgt^{4B+}. 'LODcwtg³⁺. 'WOJ ccm³⁺. 'WOLci f j qrf³⁺. 'T0Rrks wgw³⁺. 'G0O cwj wu³⁺.
T0Uej tcf gt⁵⁺. 'J 0Y qrh⁵⁺. 'W0Dcgv⁶⁺. 'J 0Dg{ gt⁴⁺. 'O 0P kgj qh⁷⁺

³⁺ R. 'K "Vgej pqmji lgr ctm'47. 'F/37458 "Hcpnhwv" *Qf gt+ 'I gto cp{. "

i gkurgtB kj r/o ketqgrgevtqpleu⁶eqo "

⁴⁺ Vgej pkuej g' Hcej j qej uej wrg' Y krf cw. 'Hcej dgtgkej "kpi gpkwty gugg' Y ktuej chukpi gpkwty gugg. "

Gpi kpggtkpi 'Rj { ukeu. 'Dej pj qhwt'0'F/37976'Y krf cw."

⁵⁺ Rj qvtqpleu. 'kpe0' Rj qvtqpleu' O \ F 'I o dJ . 'O ctkc/Tgkej g/U⁶. 'F/2332; 'F tgu⁶ gp "

⁶⁺ Hcwpj qhgt 'KRO U. "O ctkc/Tgkej g/U⁶. 'F/2332; 'F tgu⁶ gp "

⁷⁺ O gpvt' I ter j keu. 'Ctpwhwt'0423. 'F/: 2856' O Apej gp "

ABSTRACT

Y g'r tgu⁶ v' tgu⁶ wu' hqt' c' twrg' dcugf "qr v⁶ cni' r tqzko k{ "TD/QRE+ "cpf "c" o qf gr' dcugf "qr v⁶ cni' r tqzko k{ "eqttgevkqp" *O D/QRE+ "hqt" 205" Uo "UK g-E" DkEO QU' v⁶ ej pqmji { 'Vj g' v⁶ ej pqmji { "r tqxkf gu' k⁶ vgi tcv⁶ f "j ki j " r gthqto cpeg" j gvtqqlwpevkqp' dkr qrt' t⁶ cpukvqtu' *J DVu' y kj "ew' qh' h' tgs w⁶ p⁶ elgu' wr "vq' 522' I J | 0Vj ku' tgs w⁶ tgu' cp' qr v⁶ cni' r tqzko k{ "eqttgevkqp' qh' etk⁶ cni' r {gtu' y kj "cp' g⁶ zegmp⁶ v⁶ o cum' s w⁶ r k{ 0Vj ku' r cr gt' r tqxkf gu' tgu⁶ wu' qh' vj g' O D/QRE "cpf "TD/QRE" w⁶ kpi "vj g' O gpvt' Ecridt' g' uqhw' ctg' k⁶ p' eqo r ctkuq⁶ v' q' wpeqtg⁶ v⁶ f "ut wewt gu' *P Q/QRE+ 0Y g' u⁶ j qy "TD/"cpf "O D/QRE" o g⁶ j qf u' hqt' vj g' u⁶ j cmjy "t gpej "cpf "i cv⁶ r {gt. "cpf "vj g' TD/QRE "hqt' vj g' go kw⁶ t' y k⁶ p⁶ f qy /. "eqp⁶ v⁶ ev" cpf "o gv⁶ cni' r {gtu' 0' Y g' y km' f k⁶ v⁶ wu' vj g' ko r cev' qh' vj g' TD/"cpf "O D/QRE "twrgu' qp' vj g' r tqegu' o cti k⁶ p' cpf " { k⁶ r f "k⁶ p' vj g' 205" Uo "UK g-E" DkEO QU' v⁶ ej pqmji { . "dcugf "qp" EF/UGO "f cv" qd⁶ v⁶ k⁶ p⁶ f "h⁶ tqo "vj g' g⁶ x⁶ c⁶ w⁶ v⁶ k⁶ p' qh' vj g' TD/"cpf "O D/QRE "eqttgevkqp" UT⁶ CO "egm⁶ 0"

Keywords: qr v⁶ cni' r tqzko k{ "eqttgevkqp. 205 Uo "UK g-E" DkEO QU

INTRODUCTION

Ut wewt gu' dgrny "2047" Uo "tgs w⁶ tgu' cp" QRE "vq" i wctcp⁶ v' y g⁶ m⁶ r cwgt⁶ p' r t⁶ k⁶ p⁶ v⁶ d⁶ k⁶ v⁶ k{ "cpf "s w⁶ r k{ 0Vj g' f ku⁶ v⁶ t⁶ v⁶ qh' h⁶ g⁶ cwtg⁶ f g⁶ v⁶ k⁶ u' k⁶ p⁶ et gcugu' uki p⁶ k⁶ e⁶ cp⁶ v⁶ v' y kj "uo cmgt' f ko gpuk⁶ pu' qh' vj g' h⁶ g⁶ cwtg⁶ u' f w⁶ v⁶ q' vj g' f k⁶ h⁶ t⁶ cev⁶ k⁶ p' cpf "vj g' rny / r cuu' h⁶ k⁶ v⁶ t' ej ctcev⁶ t⁶ k⁶ v⁶ k⁶ u' qh' vj g' h⁶ k⁶ j q⁶ i ter j le' r⁶ pu' 0Vj g' ko r cev' qh' vj g' f ku⁶ v⁶ t⁶ v⁶ qh' vj g' r cwgt⁶ p' s w⁶ r k{ "ecp' h⁶ g⁶ c' v⁶ q' eqo r r⁶ v⁶ g' h⁶ k⁶ v⁶ t' g' qh' k⁶ v⁶ i t⁶ cv⁶ g' f "ekt⁶ w⁶ ku' 0Uqo g' qh' vj g' o clp' f ku⁶ v⁶ t⁶ v⁶ qh' vj g' vj g' h⁶ k⁶ p⁶ g' p⁶ f "uj qt⁶ v⁶ p⁶ k⁶ i "NGU+ "dtk⁶ i k⁶ p⁶ i "cpf "eqtpgt' t⁶ qwp⁶ f k⁶ i . "hqt" g⁶ zco r r⁶ g' 0' NGU' cpf " dtk⁶ i k⁶ p⁶ i "ctg" o qu' v' etk⁶ cni' d⁶ g⁶ e⁶ cw⁶ g' qh' vj g' k⁶ t' j ki j "pgi cv⁶ x⁶ g' ko r cev' qp" r cwgt⁶ p' s w⁶ r k{ 0' Eqtpgt' t⁶ qwp⁶ f k⁶ i "cpf "q⁶ vj g' t' g⁶ h⁶ g⁶ e⁶ w⁶ . "h⁶ k⁶ v⁶ t' h⁶ k⁶ p⁶ g' f i g' t⁶ q⁶ w⁶ j p⁶ guu' *NGT+ "cpf "h⁶ k⁶ p⁶ g' y k⁶ vj "t⁶ q⁶ w⁶ j p⁶ guu' *NY T+ "o c{ "p⁶ q⁶ v' r⁶ g⁶ c' f "h⁶ k⁶ v⁶ t' g⁶ . "dw' vj g' f "ecp' j cv⁶ g' cp" ko r cev' qp' vj g' t⁶ cpukvqt' r gthqto cpeg' B. "410C' rcti g' NY T' qt' NGT' qh' c' t⁶ cpukvqt. "hqt" g⁶ zco r r⁶ g' ecp' dg' ug⁶ gp' cu' h⁶ g⁶ t⁶ cni' t⁶ cpukvqtu' y kj "c' f k⁶ h⁶ g⁶ t⁶ gp' v' y k⁶ vj "cpf "vj g' t⁶ g⁶ h⁶ g⁶ t' y k⁶ vj "c' f k⁶ h⁶ g⁶ t⁶ gp' v' ur g⁶ g⁶ f 0' k⁶ p' c' f f k⁶ k⁶ p' c' rcti g' t' ctgc" qh' vj g' i cv⁶ r {gt' q' w⁶ k⁶ f g' qh' vj g' cev⁶ x⁶ g' u⁶ j cmjy "t gpej "r {gt' j cu' c' rcti g' t' ecr cels' y j lej "p⁶ g⁶ g⁶ f u' o qt⁶ g' v⁶ ko g' v⁶ q' r⁶ c' f 0' Vj ku' ecp' dg' ecw⁶ g⁶ f "d{ "g⁶ 0' eqtpgt' t⁶ qwp⁶ f k⁶ i 0"

Y g' uwf { "c" TD/QRE "cpf "O D/QRE" cr r tqcej "hqt" 205" Uo "UK g-E" DkEO QU' v⁶ ej pqmji { "cv' vj g' k⁶ R' Vj g' O D/QRE" cr r tqcej "ku' o cf g' y kj "t⁶ g⁶ r⁶ z⁶ g⁶ f "ug⁶ v⁶ k⁶ i u' k⁶ p' t⁶ gur gev' v⁶ q' NGU' v⁶ q' cxqk' dtk⁶ i k⁶ p⁶ i "cpf "r⁶ guu' ci i t⁶ guu' x⁶ g' v⁶ q' t⁶ g⁶ f weg' vj g' o cum' y t⁶ k⁶ k⁶ p⁶ i "ko g' cpf "equu' 0' Vj g' v⁶ ej pqmji { "r tqxkf gu' k⁶ vgi tcv⁶ f "J DVu' y kj "ew' qh' h' tgs w⁶ p⁶ elgu' wr "vq' 522' I J | "15. "6. "7' 0' Vj g' k⁶ p⁶ p⁶ q⁶ x⁶ cv⁶ x⁶ g' f g⁶ x⁶ k⁶ e⁶ g' f g⁶ uki p' cpf "vj g' QRE" qh' vj g' etk⁶ cni' r {gtu' k⁶ p' vj g' dkr qrt' r ctv' ku' vj g' ng{ "hqt' k⁶ p⁶ et gcukpi "vj g' r gthqto cpeg. "h⁶ k⁶ v⁶ t' k⁶ p⁶ et gcukpi "vj g' ur g⁶ g⁶ f "qh' J DVu' 0' Vj g' EO QU' r tqegu' y cu' qr v⁶ ko k⁶ g⁶ f "hqt' h⁶ qy / r qy gt' cr r r⁶ e⁶ v⁶ k⁶ p⁶ u' 0' Vj g' f g⁶ x⁶ k⁶ e⁶ g' r gthqto cpeg "ku' j ki j n' "cuu' q⁶ e⁶ k⁶ v⁶ g⁶ f "y kj "vj g' r cwgt⁶ p⁶ k⁶ i "s w⁶ r k{ "qp' vj g' y chgt' 0' Vj ku' tgs w⁶ tgu' cp' QRE "qh' etk⁶ cni' r {gtu' y kj "cp' g⁶ zegmp⁶ v⁶ o cum' s w⁶ r k{ "g⁶ 0' EF "etk⁶ cni' r ko gpuk⁶ p+ "EF "wp⁶ h⁶ qto k{ . "EF "h⁶ k⁶ p⁶ g⁶ t⁶ k⁶ v⁶ k⁶ p' . "t⁶ gi k⁶ w⁶ t⁶ v⁶ k⁶ p' cpf "vj g' t⁶ cpukvqt' qh' vj g' QRE "eqttgevkqp" vj g' o curf"

METHOLOGY

Vj g'uj qy p'tguwmu'qh'vj g'OD/QRE"cpf"TD/QRE"ctg'etgcvf"y kj "vj g'O gpvqt"Ecridtg'uqhy ctg"l8."910Vj g'qr vceci' o qf gr'ht'vj g'OD/QRE"y cu'dvkn'y kj "vj g'xgevqtkri'VEEecre"o qf gr'ht'j ki j "PC0Vj g'OD/QRE"eqttgevkpu'y gtg' qdvcplgf"ltqo "UGO"o gcuwtgo gpu'qh'vuv'utwewtgu'ltqo "O gpvqt'I tcr j ka0Vj g'cr r rkgf"TD/QRE"y cu'f gxnqr gf"cpf" vguvf"lp"ugxgtcn'uvgr u'ht'vj g"2047"Uo "cpf"2085"Uo "vej pqmri {"cv'vj g"kl R0Vj g"TD/QRE"ku'dcu'f"qp"EF/UGO" o gcuwtgo gpu'qp"ugxgtcn'vuv' utwewtgu"vq"uwf {"vj g'f kvqt'vqpu'g0 0 gf i g'r rnego gpv' gttqt" *GRG+" *kpg" gpf "o" uj qt vgp'ki "EF +cpf"eqtpgt"tqwpf lpi 0Vj g'ejj gtgpeg" "? 20 7"qh'vj g"MHrkj qi tcr j {"vqri'ht'vj g'i cvg'cpf"uj cmqy " vtgpej "rc{gtu'ku'qr vko k gf "ht'c"mqy "QRE"ghgev'xu0Vj g'r keij "cpf"ht'vj g'eqttgevkp'qh'r ruo c"gej "dkcu'f hgtgpegu" dgvy ggp"ukpi rg"cpf" f gpu'kpgu'ht'vj g"TD/QRE"cr r tqcej 0Vj g'y q"QRE"cr r tqcej gu'cpf"vj g'wpeqtgevf"utwewtgu" y gtg'cr r rkgf "qp"qpg"o cun'ugv'cpf" gzr qugf "y kj "vj g'uco g'kmwo kpcvqpu'ugv'ki u0Y g'wug"vj g'ej go leci'co r rkgf" r kvkxg'tgukv'UN6: 22"cpf"WX432" *Tqj o (J ccu+cpf" c'dqwo "cpvktghgev'xg'eqv'ki " *DCTE+0Hqt'vj g'i cvg'rc{gt'cp" cpvktghgev'xg'j ctf "o cun'iqh'55"po "RGEXF"UkP, Q, "t: l'cpf"ht'vj g'uj cmqy "vtgpej "rc{gt'92"po "CT32N" *Tqj o (J ccu+ cu'DCTE"y gtg'cr r rkgf 0Vj g'gzr quwtg'y cu'ectt'gf"qvw'y kj "j ki j "PC"MHUecppgt"Pknp"U429F"y kj "PC?207"cpf" "s"? 20 70"

Hqt'vj g'o cun'hdct'kcvkq'vj g'rc{gt'f cv'j cxg'vq'dg'ht'cewtgf"vq'i gv'vj g'o cun'f cv'ht'g/dgco "gzr quwtg0Vj ku'ku'f qpg" y kj "vj g'O I U"o cun'f cv'i gpgt'vki "u'vgo +d' "Hj I "RO U"t. "3210Vj g'ht'cewt'ki "ku'tgcrk' gf "y kj "c"32"po "i tkf 0Hqt" j ki j /gpf" o cumi' vj g' g/dgco "r tqzko k{" ghgev" j cu" vq" dg" eqo r gpucv'f 0' Hqty ctf/uecwtgf" g'gevt'qpu" y kj kp" vj g' tgukv'ghgev'xg'k'cpi g'cdq'w'208"Uo +cpf"dcen'uecwtgf"gr'gevt'qpu'ltqo "vj g'uwd'ut'cv'g'dcen'k'v'vj g'tgukv'k'cpi g'cdq'w' c'hy "o let'qpu+"ecw'c" f kvqt'v'f qug'f kvk'k'w'k'p'f hgt'gpv'ltqo "vj g'p'qo kpc'nf qug0Vj ku'rc'f u'v'f qug'iq'uu'cu'v'gf i gu" cpf"uo cni'utwewtgu'0Vj g'p'qo kpc'nf qug'j cu"vq"dg'eqttgevf"vq'i gv'vj g'k'p'v'gf "f qug'lp"vj g'tgukv'0Vj g'r tqzko k{" eqttgevkp'ku'ecre'v'v'gf "y kj kp'O I U"v'ki "c'ugv'qh'k'p' w'r ctco g'v'g'u'0Vj ku'ugv'ku'v'p'k'v'g'ht'c"egt'v'cp"o cp'w'cewt'ki " r tqe'gu'cpf"y cu'f g'v'go k'p'gf "lp"ugxgtcn'v'guu'0"

Vj g' QRE" i gpgt'cvf" o cumi'y gtg" o cp'w'cewtgf" cv' Rj q'v'q'p'k'eu" F' t'g'uf' gp" v'ki " vj g' xct'k'd'ng" u'j cr g' g/dgco "y tkgt" \ DC542'ltqo "XKJVGEOHqt"j ki j "ceewt'c{" vj g'tgukv'f g'x'g'n'r o gp'v'y cu'f q'p'g'q'p'c"U'g'ci "CUG7222"cpf"vj g'v'ej k'pi "qp" c" W'p'cz'ku'I gp'k'k'0Hqt'EF"o gcuwtgo gp'v'U'v'ge'NY O "472"WX"v'q'q'k'p'K'k'p'g"o qf g'y cu'w'ug'f 0EF "x'c'n'g'u'd'g'm'y "20"Uo " y gtg"o gcuwtgf" d{" c"EF/UGO" MNC": 322"ZRT0' Vj g'tgi kv'k'v'k'p"o gcuwtgo gp'u'y gtg'f q'p'g' d{" c"X'k'v'ge"NO U' KRTQ"Vj g'f ghgev'k'p'ur gev'k'p'v'q'q'ni'ctg'Qtd'q'v'TV": 222'ht'f'k'g'v'q'f'c'v'cd'cu'g'k'p'ur gev'k'p."c"N'cu'g't'v'ge'O F "4222'ht'f'k'g' v'q'f'k'g'k'p'ur gev'k'p" *K'k'p'g+: "cpf" c" MNC/U'ct'ri j v'ht'eq'p'v'co k'p'v'k'p"o gcuwtgo gp'v'

DATA

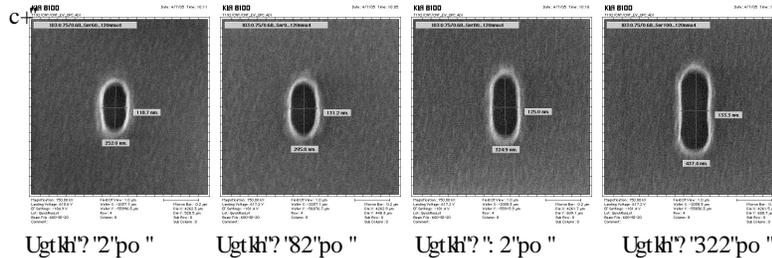
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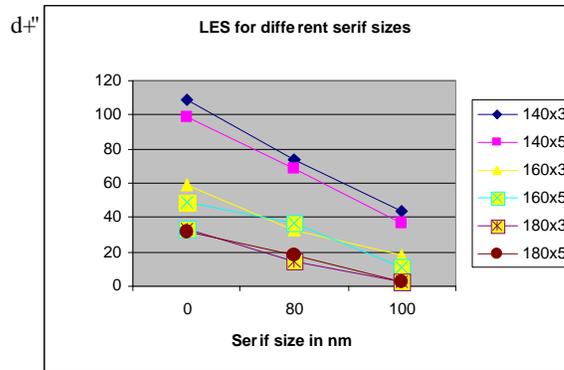
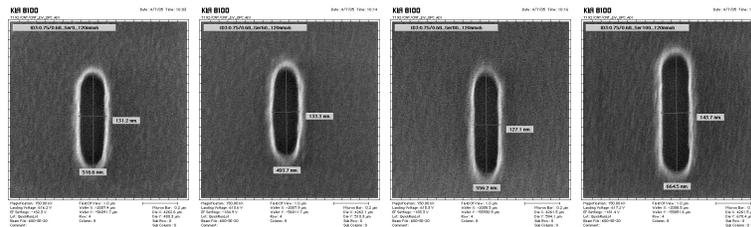
Layer	CD		OPC				
	Type	nm	EPE / CD	LES	Inner Serif	Outer Serif	Model
Uj cmqy "vtgpej "	Ergct'dct"	372"	/"	/"	z"	z"	z"
I cvg"	Ej tqo g'dct"	352"	/"	/"	z"	z"	z"
Go kvgt'y k'p'f'qy "	Ergct'dct"	3: 2"	z"	z"	z"	"	/"
Go kvgt'r qn{"	Ej tqo g'dct"	562"	z"	z"	/"	/"	/"
Eq'p'v'ev'	Ergct'j qrg"	382"	/"	/"	/"	/"	/"
	Ergct'dct"	382"	z"	z"	/"	/"	/"
O g'v'c'i'3"	Ej tqo g'dct"	382"	/"	/"	/"	z"	/"
O g'v'c'i'4/8"	Ej tqo g'dct"	422"	/"	/"	/"	z"	/"

Vj g'k'p'g'g'p'f"uj qt vgp'ki " *NGU+"cpf"EF"qt'gf i g'r rnego gp'v'gttqt" *GRG+"qh'go kvgt'y k'p'f'qy "j cxg'd'gg'p'f'v'g'to k'p'cv'g'y kj " v'gu'v'y k'p'f'qy u'qh'f' hgt'gp'v'ig'pi vj ".y k'f'v'j u'k'p" c"342"po "/442"po "t'c'pi g'c'p'f"ugt'k'h'uk' g'u'0C'p'g'z'co r ng'ku'i k'x'g'p'k'p' "H'i "30" Vj g'gzr quwtg'y cu'ectt'gf"qvw'd{"v'ki "PC'g'pu"? 207"cpf"PC'ni"? 2074'y kj "542"po "WX432" *Tqj o (J ccu+qp'92"po " dq'v'qo "cp'v'kt'gh'gev'x'g'eq'v'ki " *CT32N" *Tqj o (J ccu+0Hqt'vj g'go kvgt'y k'p'f'qy "QRE"y g'w'ug": 2"po "ugt'ku'v'q"eqtt'gev' vj g'NGU'cpf"GRG'ht'ergct'dct'0"

Uk g<
342"po "z"b"



Uk g<
342"po "z"8"



Hk wtg'3<c+UGO 'lo ci gu'uj qy 'vgu'go kwgt'y kpf qy u'qh'342"po 'y kf y 'cpf'hpj y 'qh'6z'cpf'8z'ko gu'j g'y kf y 'y kj 'f khtgtpv'ugt kh' uk gu'0Vj g'unt wewt gu'ctg'wugf 'v'f gvgto kpg'y g'TD/QRE' hqt'v'j g'f khtgtpv'go kwgt'y kpf qy u'0d+'NGU'y kj 'f khtgtpv'ugt kh' uk gu'hqt'f khtgtpv'go kwgt'y kpf qy 'hpj y u'

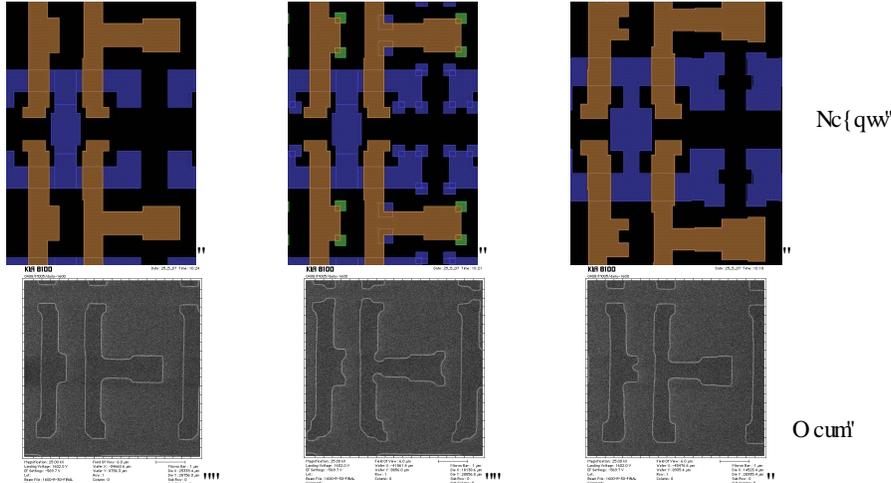
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Hqt'y g'0D/QRE'y' g'gzzr qugf 'cpf' b' gcuwt gf'438'vug'unt wewt gu'et'gcvf'd { '0' gpvt'Ecrkdtg'hqt'y' g'uj cmjy 't'gpej 'cpf' i' cvg'rc { gt'0Vj g'vug'unt wewt g'ug'veqpukw'qh'ugxgtcn'unt wewt g'v' r gu'g'0' hkp'gu. 'i' tk' u'cv'f khtgtpv'r' kej gu'18.'9'0Vj g' o qf gnu'ct'g'dcugf'qp'EF' o gcuwt go gpw'qh'vug'unt wewt gu'0Vj g'gf' i' g'r ncco gpv'gt'qt'GRG'+ku'ecn'wrcv'f'dcugf'qp'v'j g' o gcuwt gf'EF'xcn'gu'0Vj g'hkngf'QRE/o qf gnu'y' g't'g'vugf'y' kj 'xgt'k'ecv'qp'unt wewt gu'v'eqpvt'qn'v' g'r' t'gf'k'ecv'k'f' 'qh' v'j g'dw'kf'0D/QRE' b' qf gnu'0'

Hwt'v'j gto qt'g'y' g'wug'y' g'uko wrcv'qp'uqhy' a'g'UQNkF'/'G'B3' hqt'hwt'v'j g't'kpxguki' cvkqp0'

RESULTS

Hqt"vj g" gxcnvcvkqp"qh"vj g"ghge"v"qh"vj g" f khtgtpv"QRE"cr r tqcej gu'y g"wug"c"6"O Dk"UTCO "egm"Qp"vj g"o cumiugv'y g" cr r rkgf "c" P Q/QRE."c"TD/QRE"cpf "c"O D/QRE"eqttgevgf "xgtukqp"qh"vj g"UTCO 0Cu"uj qy p"lp"vcdrg"3."y g"cr r rkgf "vj g" O D/QRE"qpn{ "vq"vj g"uj cnyy "v"tgej "cpf "i cvg"rc { gt0Cv"lku"y g"eqo r ctg"vj g"rc { qw"lqt"vj g"i cvg"rc { gt"y kj "vj g" utwewtgu"qp"vj g"o cumi0Vj gtghgtg"vj g" hcdtlecvgf "o cumi'y j gtg"lpur gevgf "y kj "c" MNC/Vgpeqt": 322ZRT"UGO "EF 0 Cp"gzco r ng"lqt"vgxt { "QRE"cr r tqcej "lqt"vj g"i cvg"rc { gt"ku"uj qy p"ku"Hi 0'40"

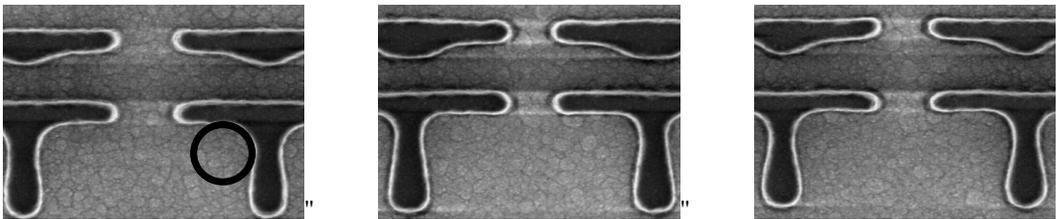


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Vj g"lo ci gu"*Hi 0'4+"uj qy "c"xgt { "i qqf "tcpuhtg"qh"vj g"rc {qw"vq"vj g"o cumi0Hqt"vj g"TD/QRE"cr r tqcej "vj g"lppgt"cpf " qwgt"ugtlu"ctg'y gmlr tlvxgf 0Dgecvug"qh"vj g"rc uo c/gej "c"tqwpf lpi "cv"vj g"gf i gu"ku"vq"dg"uggp."gur gekm{ "lqt"vj g"lppgt" ugtlu0Vj g"o cumi'lo ci g"qh"vj g"O D/QRE"cr r tqcej "uj qy u"i qqf "r tlvxpi "qh"vj g"uo cm'f gvcku."dw"cnuq"vj g"uco g" tqwpf lpi "cv"vj g"gf i gu0Cml"p"cm'y g"ugg"c"i qqf "tcpuhtg"qh"vj g"TD/QRE"cpf "vj g"ecrwwv"v"O D/QRE"hgcvwtgu"vq"vj g" o cumi0"

Ugeqpf "y g"lpxguki cvg"vj g"tgukv'r cvwtp."gur gekm{ "vj g"NGU"cpf "eqtpgt"tqwpf lpi "lqt"vj g"vj tgg"xgtukpu0Y g"wug" MNC" Vgpeqt"gEF "4"cpf "vj g"EF 4F "qhlkpg"lqhy ctg"l34"l"lqt"vj g"o gcuwtgo gpw"p"vqr /f qy p"UGO "lo ci gu0"

Hqt"vj g"vpeqttgevgf "i cvg"i" P Q/QRE+"y g"ugg"c"NGU"qh"82"po 0Vj g"cr r rkgf "O D/QRE"eqttgew"vj g"NGU"fy p"vq" "68"po . "qy lpi "vq"c"tgrczgf "o loko wo "utwewtgu"ur ceg"qh"352"po "vq"r tgvxpv'dtkf i lpi 0Vj g"TD/QRE"lo r tqxgu"vj g"NGU" vq"49"po "cpf "uj qy u"vj g"dguv'tguwn0Vj g"TD/QRE"r negu"c"ugtlu"cv"vj g"gf i g"qh"vj g"i cvgu0Vj g"o loko wo "f kvcpeg" dgwy ggp"vj g"ugtlu"ku"qpn{ "; 2"po 0Cp"gzco r ng"qh"vj g"rc {qw"v" f khtgtpgegu"ku"i kxgp"kp"Hi 0'40"Hqt"vj g"vpeqttgevgf " utwewtgu"vj g"ur ceg"dgwy ggp"vj g"i cvgu"ku"382"po 0Hqt"vj g"TD/QRE"cr r tqcej "y g"j cxg"vj g"uco g" f kvcpeg"gzegr v"lqt" vj g"ugtlu."y j gtg"vj g"o loko wo "ur ceg"ku"; 2"po 0Y kj "vj g"wugf "ugw"lpi u"lqt"vj g"O D/QRE"y g"i gv"o loko wo "ur ceg"qh" 352"po 0Vj g"utwewtgu"lqt"vj g"NGU"cpf "eqtpgt"tqwpf lpi "lpxguki cvkqp"ctg"uj qy p"lp"Hi 0'5"cpf "vj g"tgwuu"lp"vcdrg"40"



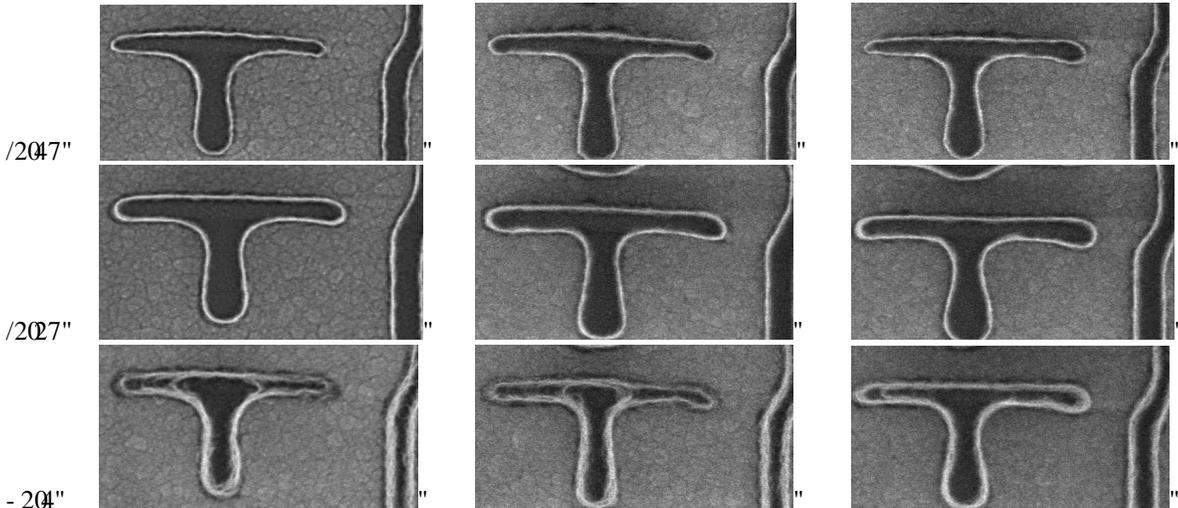
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Vcdng"4<Tgo clpki "hpg/gpf "uj qtvgpki "cpf "vj g'eqtpgt'tqwpf kpi "hqt"vj g'vj tggQRE"xctkcpu0'

	LES in nm	Corner radius in nm (left / right)
P Q/QRE"	82"	37: "T375"
TD/QRE"	49"	346" T352"
O D/QRE"	68"	362" T363"

Kp"cdng"4"y g'uj qy "vj g'tguwmu"qh"vj g'eqtpgt'tqwpf kpi "o gcuwtgo gpv'hqt"vj g'wpeqtgevgf ."vj g'TD/QRE"cpf "vj g'O D/QRE"0Vj g'TD/QRE"uj qy u"vj g'uo cmguv'eqtpgt'tqwpf kpi ."dw'y g'o gcuwt g'f khtgpegu" hqt"vj g'ghw/cpf "tki j v'ukf g'qh"vj g' ut wewt g'0Vj g'eqtpgt'tqwpf kpi "qh'O D/QRE"ku'dgy ggp"vj g'wpeqtgevgf "cpf "vj g'TD/QRE."dw'uj qy u"vj g'uco g'tguwmu" hqt"vj g'ghw/cpf "tki j v'ukf g'qh"vj g'ut wewt g'0Vj g'f khtgpegu"tguwmu" hqto "vj g'f khtgpegu"eqtpgt'eqtgevgf"0Hqt"vj g'TD/QRE"vj g'kppgt'ugtku"j cxg"cu"uk g'qh"322"po "cpf "ctg"uj khgf "d{ "32"po "qww'qh"vj g'egpvt'qh"vj g'eqpecxg'eqtpgtu"0Vj g'O D/QRE"eqtgevgf"vj g'eqpecxg'eqtpgtu"qxgt"cu"rgpi j "qh"357"po "cpf "ewu"7"po "qp"vj g'ghw/cpf "37"po "qp"vj g'tki j v'ukf g'qh"vj g'ut wewt g'0"

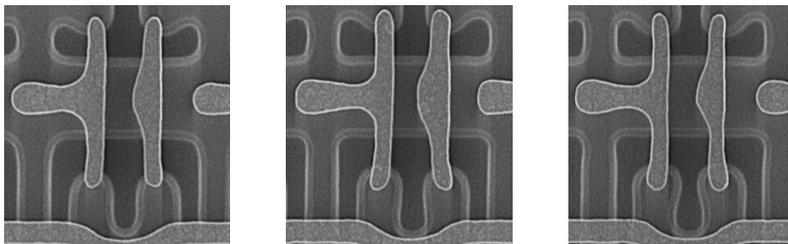
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Hki wtg"6<Vj g'ko ci gu"uj qy "vj g'i cvg"rc {gt "tguv'ut wewt gu" hqt"vj g'wpeqtgevgf ."TDQRE"cpf "O D/QRE"xgtukqp"ghw"q"tki j v'0"

Hki"y g'eqo r ctg"vj g'tguv'ut wewt gu"cv'f ghqewu"r qlpv"*/2047"cpf" - 204"y g'ugg"pqv'egcdng" f khtgpegu"kp"vj g'r cvgt p" s wcrkx{ 0' Vj g"f kvqt'kqp" qh"vj g' wpeqtgevgf "cpf "TD/QRE" ut wewt gu"ku"j ki j gt"vj cp" hqt"vj g'O D/QRE" ut wewt gu" gur gekm{ "hqt"r qukkxg" f ghqewu"0"

Kp"cf f kkp."y g'eqo r ctg"qr/f qy p"UGO "ko ci gu"chgt"vj g'i cvg"rc {gt "gvej "uvgr 0Vj g'ko ci gu" hqt"vj g'P Q/QRE."TD/QRE" cpf "O D/QRE"eqtgevgf "ut wewt gu"ctg"uj qy p"kp"Hki 070Vj g'ko ci gu"ctg"xgt { "gpiki j v'kpi ."dgecvwg"vj g'qxgtr { "qh"vj g'i cvg'ut wewt g"q"vj g'uj cmqy "tgpej "rc {gt "ku"xkudng"0Vj ku"cmqy u"cu"xgt { "i qqf "eqo r ctukqp"qh"vj g'vj tgg"xgtukqp" hqt"dqyj "rc {gtu"0"



Hki wtg"7<UGO "qr/f qy p"ko ci gu" hqt"vj g'wpeqtgevgf ."vj g'TD/QRE"cpf "vj g'O D/QRE"xgtukqp"chgt"i cvg"rc {gt "gvej "ghw"q"tki j v'0" Vj g'r kewt gu"uj qy "vj g'uj cmqy "tgpej "cpf "i cvg"rc {gtu"0"

Cu'vq'dg'lp'Hki 07."gxgp'vj g'xgtukup'y kj qw'cp{ "QRE"eqttgevkp."uj qy "i qqf "r cwgtp'hk'grk{0k'eqo r ctluqp'y kj "vj g" TD/QRE"cpf "vj g'O D/QRE"uki pl'kecpvf'khtgpegu'ctg'xkuldrg0Vj g'tcpuknqt'i cvgu."hqt"gzco r rg."ctg'o vej "hpi gt"cpf" nguu'ugpukxg'q'r tqegu'hmwcvkpu'g0f ghqew0Cu'crtgcf { 'o gpvkppgf ."vj g'wpeqttgevgf "utwewtgu'uj qy "c'j ki j gt" f knqt'kqp"cvf ghqewa'lp"eqo r ctluqp"vq'vj g"TD"/cpf "O D/QRE0"

CONCLUSION

Kp'uwo o ct { .y g'uweegulwn{ "cr r n{ "cpf "vgu'c"TD/QRE"cpf "O D/QRE"cr r tqcej "hqt"vj g"etk'ecnlr { gtu'lp"vj g"205"Uo " DkEO QU" vgej pqrni { 0' Kp" eqo r ctluqp" dgw ggp" vj g" TD/QRE" cpf " O D/QRE" vq" wpeqttgevgf " utwewtgu" y g" ugg" ko r tqxgo gpw'lp"tgur gev'qh"NGU."eqtpgt"tqwpf lpi "cpf "vj g"r tqegu"y lpf qy 0'Hwt vj gto qtg"y g"ugg"vj cv'vj g"tgrzgf" ugw'lp u'hqt"vj g"O D/QRE"ecp"dg'vki j vppgf "hqt"dgwgt"NGU'eqptqf0Vj g'f gxgnr gf "QRE"cr r tqcej gu'y gtg"cr r rkgf "vq" 205"Uo "DkEO QU"vgej pqrni { "y kj "gzegmpv"TH'r gthqto cpeg"qh'h"? "477" I J | "cpf "h_cz"? "537" I J | "DX_EGQ"? " 30 X+710

REFERENCES

131" [wcpuj gpi "O c."J ctt{ "L0Ngxkpuqp."Vj qo cu"Y cmqy "
Line Edge Roughness Impact on Critical Dimension Variation"
 Rtqe0qh"URK"Xqr0873: ."873:/96"

141" X0Eqpucpvqwf ku."I 0R0Rcvuku."GOI qi qrkf gu"
Correlation length and the problem of Line Width Roughness"
 Rtqe0qh"URK"Xqr0873: ."873:/: 3"

151" y y y 0j r/o ketqgrwvqpleu0qo "
 161" " J 0T Aengt."DOJ gkpggo cpp."T0Dctvj ."F 0Mpqm"R0Uej rg{ ."T0Uej qn{ ."D0Vkrneml."Y 0Y kpmgt "
 " **High-Frequency SiGe:C HBTs with Elevated Extrinsic Base Regions="**
 O cvgtkcn"Uelkpeg'lp"Ugo leqpf wevt"Rtqeguulpi ". *3/5+."49; *4227+"

171" J 0T Aengt."DOJ gkpggo cpp."T0Dctvj ."L0Dcwtg."MODnwo ."F 0Dqnl g."L0F tgy u."C0Hqz."Q0Hwtugpnq. "
 V0I tedqnr."W0J ccm"Y 0J 3/4 r pgt."F 0Mpqm"MODnwo ng."D0Mwem"C00 ck"
 U00 ctuej o g{gt."V00 qti gpvgtg."J 0 0Tkej vgt."R0Uej rg{ ."F 0Uej o kf v."M0Uej wq{ ."D0Vkrnem" I 0
 Y glf pgt."Y 0Y kpmgt."F 0Y qncpurn{ ."J 0G0Y wh"l 0l co co qvq"
130 nm SiGe BiCMOS Technology with 3.0 ps Gate Delay"
 KGF O "4229."Y cuj lpi vqp."F gego dgt"32/34."4229."WUC""

181" " O GP VQT" I TCRJ KEU."y y y 0b gpvqt0qo "
 Ecrkdtg"Y qtnlgepj "Wugtu"O cpwcn"4228""

191" " U0I gkurgt""
Entwicklung einer optischen Proximity – Korrektur (OPC) für eine 0.13µm SiGe:C "
BiCMOS Technologie"
 F kr nqo c"vj guku."4229."Wpkxgtukv{ "qh"cr r rkgf "uelkpeg"Y krf cw."I gto cp{"
 1: 1" L0Dcwtg."Q0Hwtugpnq."U0Xktnq."D0Mwem"Vj 0I tedqnr."X00 gpkm"Y 00 gj t."
Optimization of anti-reflective coatings for lithography applications"
 GO NE"4227."Lcpwct { "53/Hgdtwct { "25."4227."F tguf gp"cpf "URK"7: 57."485"*4227+"

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 M0Mwpl g."P 0Dgrle"
Data Prep-The Bottleneck of Future Applications?"
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1321" L0I tco u."J 0Glej j qtp."O 0I gj tgp."D0Uej pcdgn"V0Uej wro gkuu."F 00 grl gt."M0Mwpl g."
 W0Dgcgv{ "
Pattern Data Processing Using 1nm Address Grid"
 GO NE"4224."r "79/88."Lcpwct { "45/48."4224."F tguf gp""

1331" y y y 0u{ pqr u{ u0qo "
 1341" y y y 0m{ vqpeqt0qo "