Attack ID No	Seque	nce				Des	cription	of Attacl	(					
2	1			2: Cybera		IP com	panies (I	P Piracy	Attack)	the atta	acker is t	ring to		
				formation										
CIST Category	Cou	nterfeit	ing	Informa		kage	S	abotage		T	amperin	g		
	-	False			True			False			False			
Attacker		L - Adve	- 1		- Advers	- 1		3 - Advers	-		4 - Adve	-		
		all groupous hack	-		academic arch grou			organise ninal gan			tate-fund ganisatio			
		ack Lev			ack Level	- 1		tack Leve	_		tack Lev			
		wage 1			wage 1-3			wage 1-			n wage 1			
Highest Level		2			3			3			4			
Min Attack		2												
Level														
Stages	Sta	ge 1	St	age 2	Sta	ge 3	Sta	ge 4	Sta	ge 5	Sta	ge 6		
	Sourc	ing IP	Sys	tem on	ı	С	Test	ing &	IC U	sage	Recyc	ling IC		
	Des	igns	Chi	p (SoC)	Fabrica	ation &	Pack	aging						
			Inte	gration		mbly								
Stage Attack	Y	es		Yes	Y	es	Y	es						
Possible?														
Defences		unterfe	_		nation Lo	_		Sabotage			amperir	•		
ID No		Defence IDs         Defence IDs         Defence IDs         Defence IDs           1         2         3         10         11         12         19         20         21         23         24         25												
Stage 1								20	21			25		
	4 7	5 8	6	13	14 17	15 18	22			26	27			
Stage 2	1	2	3	16 10	11	12	19	20	21	23	24	25		
Stage 2								20	21			25		
	4	5	6	13	14	15	22			26	27			
	7	8	9	16	17	18								
Stage 3	1	2	3	10	11	12	19	20	21	23	24	25		
	4	5	6	13	14	15	22			26	27			
	7	8	9	16	17	18								
Stage 4	1	2	3	10	11	12	19	20	21	23	24	25		
	4	5	6	13	14	15	22			26	27			
	7	8	9	16	17	18								
Stage 5	1	2	3	10	11	12	19	20	21	23	24	25		
	4	5	6	13	14	15	22			26	27			
	7	8	9	16	17	18	10	20	24	22	2.4	25		
Stage 6	1	2	3	10	11	12	19	20	21	23	24	25		
	4	5	6	13	14	15	22			26	27			
Holm	7	8	9	16	17	18 Doscri	ntion							
Help	Root of	vulnara	hility			Descri	puon							
			•	lefences ir	. IT infra	ctructur	.00							
			-	ack aims to				d intalled	tual pro	nartics	(ID)			
		iiiis tyļ	טו מנוני	ick aiiii3 ll	J SIEdi U	coigii se	ciets all	a miteriet	cuai pi C	per ties	(11.)			
Defence ID						Defe	nce							
(Card)						Deic								
10 (5)	IP Piracy	/: Preve	ention Mo	ethod: Spl	it Manuf	acturin	g							
11 (6)				ethod: Hai				Camoufla	aging					
12 (7)				ethod: Hai						c Lockin	 g			
13 (8)				ethod: Hai										
14 (9)				thod: Wat				-	_		ation in	the		
,	signal	,: <del>-</del>				5 0		-	•					

Attack ID No	Sequei	nce				Des	cription o	of Attacl	k					
1	2			roduction		versary	is able p	roduce r	nore co	pies by f	rauduler	ntly		
				an origina										
CIST Category	Cou	nterfeitii	ng	Informa		kage	Sa	abotage		Ta	amperin	g		
		True			False			False			False			
Attacker		L - Advers	-		- Advers	-		3 - Adver	-		4 - Adve	-		
		all group ous hacke			academic arch grou			organise ninal gan			tate-func			
		ack Level	_		ack Level	-		ack Leve	_		ganisation			
		wage 1-2			wage 1-3			wage 1-			n wage 1	_		
Highest Level		2			3			3			4			
Min Attack		3												
Level														
Stages	Sta	ge 1	St	tage 2	Sta	ge 3	Sta	ge 4	Sta	ge 5	Sta	ge 6		
		ing IP	-	tem on		С		ing &	IC U	Isage	Recyc	ling IC		
	Des	igns		p (SoC)		ation &	Pack	aging						
Chan All			Inte	gration		mbly								
Stage Attack Possible?					Y	es								
Defences	Cou	ınterfeit	ing	Inform	nation L	akage		Sahotag	<u> </u>	Т	amnerir	าฮ		
ID No	Counterfeiting Information Leakage Sabotage Tampering Defence IDs Defence IDs Defence IDs													
Stage 1	Defence IDs         Defence IDs         Defence IDs         Defence IDs           1         2         3         10         11         12         19         20         21         23         24         2													
	4	5	6	13	14	15	22			26	27			
	7	8	9	16	17	18								
Stage 2	1	2	3	10	11	12	19	20	21	23	24	25		
_	4	5	6	13	14	15	22			26	27			
	7	8	9	16	17	18								
Stage 3	1	2	3	10	11	12	19	20	21	23	24	25		
Juge 5	4	5	6	13	14	15	22			26	27			
	7	8	9	16	17	18								
Stage 4	1	2	3	10	11	12	19	20	21	23	24	25		
	4	5	6	13	14	15	22			26	27			
	7	8	9	16	17	18								
Stage 5	1	2	3	10	11	12	19	20	21	23	24	25		
	4	5	6	13	14	15	22			26	27			
	7	8	9	16	17	18								
Stage 6	1	2	3	10	11	12	19	20	21	23	24	25		
	4	5	6	13	14	15	22			26	27			
	7	8	9	16	17	18								
Help	<b>5</b>		•1••			Descri	ption							
		vulneral	-	. IC falaniaa	. <b>.</b> :									
			_	e IC fabrica										
				o IC black			t mass:	ros to s	otost In	)c				
			_	lations or ulty associa				-						
Defence ID		recimica	ıı unnct	arry associa	ateu Will	Defe		rei prout	iceu (III	μs				
(Card)						Dele	1166							
3 (7)	Detection	on Metho	nd: Fina	erprinting	Conven	tional se	erial num	bers						
4 (8)				erprinting			z. iai iiuii							
5 (9)				erprinting			nable Fu	nctions						
6 (10)				erprinting										
3 (10)			11118	, PB		<sub>0</sub>	9							

Attack ID No	Sequei	nce				Des	cription	of Attac	k						
4	3			ction Atta								ie			
		C	computat	tion of a c	<mark>ryptogra</mark>	phic alg	g <mark>orithm t</mark>	<mark>o genera</mark>	ate fault	y results					
									T						
CIST Category	Cou	nterfeit	ing	Informa		kage	S	abotage		Ta	amperin	g			
	Class 1	False			False		Class i	False		Class	True				
Attacker		l - Adver all group	-		- Advers academic	-		3 - Adver organise	-		4 - Adve tate-fund	-			
		ous hack			arch grou			ninal gan			ganisatio				
		tack Leve			ack Level			tack Leve			tack Lev				
	can	wage 1	-2	can	wage 1-3	}	car	wage 1-	3	са	n wage 1	4			
Highest Level		2			3			3			4				
Min Attack Level		2													
Stages	Star	ge 1	St	age 2	Sta	ge 3	Sta	ge 4	Sta	ge 5	Sta	ge 6			
Stages		ing IP		tem on	1	C		ing &		sage		ling IC			
		igns	1	o (SoC)	Fabrica	ation &		aging		J	,				
			Inte	gration	Asse	mbly									
Stage Attack		Yes													
Possible?		Counterfeiting Information Leakage Sabotage Tampering													
Defences		Defence IDs Defence IDs Defence IDs Defence IDs Defence IDs													
ID No Stage 1	1	erence i	3	10	11	12	19	20	21	23	erence i	25			
Stage 1	4	5	6	13	14	15	22	20	21	26	27	23			
	7	<u></u>	9	16	17	18				20	27				
Stage 2	1	2	3	10	11	12	19	20	21	23	24	25			
	4	5	6	13	14	15	22			26	27				
	7	8	9	16	17	18									
Stage 3	1	2	3	10	11	12	19	20	21	23	24	25			
Juge 3	4		6	13	14	15	22	20		26	27	23			
	7	8	9	16	17	18									
Stage 4	1	2	3	10	11	12	19	20	21	23	24	25			
	4	5	6	13	14	15	22			26	27				
	7	8	9	16	17	18									
Stage 5	1	2	3	10	11	12	19	20	21	23	24	25			
	4	5	6	13	14	15	22			26	27				
Store C	7	8	9	16	17	18	10	20	24	22	24	25			
Stage 6	4	<u>2</u> 5	3 6	10	11 14	12 15	19 22	20	21	23 26	24 27	25			
	7	<u>5</u> 	9	16	17	18				20	21				
Help	,	J		10	1/	Descri	ption								
	Root of	vulnera	bility												
	•	Suscept	tibility of	electroni			perature	variatio	ns, supp	oly voltag	ge fluctu	ations			
		and ele	ctromag	netic intei	rference										
Defence ID						Defe	nce								
(Card)	Date	! a .a . b 4 . ·		da to to the	411	La									
27 (K)				ılt Injectio	ns Attac	KS									
	ramper	ĸesista	nt Techn	iques											

Attack ID No	Sequer	nce				Des	cription	of Attack	<b>(</b>						
5	4			erse engin	0										
				to extract	_	ate-leve	l netlist i	using a ra	ange of	tools an	d revers	e			
		er	igineei	ring techno	ologies										
CIST Category	Cour	nterfeitin	g	Informa	tion Lea	kage	Sa	abotage		T	amperin	g			
CIST Category		False			True			False			False				
Attacker		Advers	-		- Advers	- 1		3 - Advers	-		4 - Adve	-			
		all group ous hacker			cademic rch grou			organise ninal gan		_	tate-fund ganisatio				
		ack Level	3		ack Level			ack Leve	_		tack Lev				
	can	wage 1-2		can	wage 1-3		can	wage 1-	3	ca	n wage 1	-4			
Highest Level		2			3			3			4				
Min Attack		3													
Level	Ctoo	1		togo 3	Sto	2	Cto	A	Cto		C+0	50 F			
Stages	Stag Sourc			tage 2 stem on		ge 3 C		ge 4 ing &		ge 5 Isage		ge 6 ling IC			
	Desi	_	_	ip (SoC)		ation &		aging		Juge	пссус				
		<b>.</b>		egration		mbly		66							
Stage Attack							Y	es							
Possible?															
Defences		Counterfeiting Defence IDs     Information Leakage Defence IDs     Sabotage Defence IDs     Tampering Defence IDs       2     3     10     11     12     19     20     21     23     24     25													
ID No		Defence IDs Defence IDs Defence IDs													
Stage 1	4	1 2 3 10 11 12 19 20 21 23 24													
	7	8	9	16	17	18				20	2,				
Stage 2	1	2	3	10	11	12	19	20	21	23	24	25			
	4	5	6	13	14	15	22			26	27				
	7	8	9	16	17	18									
Stage 3	1	2	3	10	11	12	19	20	21	23	24	25			
	4	5	6	13	14	15	22			26	27				
	7	8	9	16	17	18									
Stage 4	1	2	3	10	11	12	19	20	21	23	24	25			
	4	5	6	13	14	15	22			26	27				
Chana F	7	8	9	16	17	18	10	20	24	22	24	25			
Stage 5	4	2 5	<u>3</u>	10 13	11 14	12 15	19 22	20	21	23 26	24 27	25			
	7	8	9	16	17	18	22			20	21				
Stage 6	1	2	3	10	11	12	19	20	21	23	24	25			
3 3 3	4	5	6	13	14	15	22			26	27				
	7	8	9	16	17	18									
Help						Descri	otion								
	Root of v														
				ween circu	iit layout	and th	e gate-le	vel netlis	st and u	ltimately	the des	ign			
Defense ID	1	function	ality			Dofo									
Defence ID (Card)						Defe	lice								
10 (5)	IP Piracy	: Preven	tion M	ethod: Spl	it Manuf	acturing	7								
11 (6)				ethod: Har				Camoufla	aging						
12 (7)	-			ethod: Har						ic Lockin	g				
13 (8)				ethod: Har											
14 (9)				thod: Wat				•			ation in t	the			
	signal														

Attack ID No	Seque	nce				Des	cription	of Attac	k				
3	5	R	Rowham	mer attacl	k used as	s a mecl	nanism b	y waging	g a persi	stent			
		a	ttack to	cause larg	ge numb	er of er	rors						
	_		. 1			. 1							
CIST Category	Cou	nterfeiti	ng	Informa		kage	Si	abotage		Т	amperin	g	
Attacker	Class	False  1 - Adver	rcom.		False - Advers	om.	Class	True 3 - Adver	comi	Class	False 4 - Adve	rcor.	
Attacker		all group	-		- Auvers academic	- 1		organise	-		4 - Auve tate-func	-	
		ous hack			rch grou			ninal gan			ganisatio		
		tack Leve			ack Level			tack Leve			ttack Lev		
11.1	car	wage 1-	-2	can	wage 1-3		car	wage 1-	3	ca	n wage 1	-4	
Highest Level Min Attack		2			3			3			4		
Level		2	5										
Stages	Sta	ge 1	St	age 2	Sta	ge 3	Sta	ge 4	Sta	ge 5	Sta	ge 6	
o tuges		ing IP		tem on		C		ing &		sage		ling IC	
		igns		p (SoC)	Fabrica	ation &		aging		J			
			Inte	gration	Asse	mbly							
Stage Attack									Y	es			
Possible?			<u> </u>		<u></u>					_			
Defences		Counterfeiting Information Leakage Sabotage Tampering Defence IDs Defence IDs Defence IDs											
ID No Stage 1	1	erence r	3	10	11	12	19	20	21	23	24	25	
Stage 1	4	5	6	13	14	15	22	20	21	26	27	23	
	7	8	9	16	17	18				20			
Stage 2	1	2	3	10	11	12	19	20	21	23	24	25	
	4	5	6	13	14	15	22			26	27		
	7	8	9	16	17	18							
Stage 3	1	2	3	10	11	12	19	20	21	23	24	25	
	4	5	6	13	14	15	22			26	27		
	7	8	9	16	17	18							
Stage 4	1	2	3	10	11	12	19	20	21	23	24	25	
	4	5	6	13	14	15	22			26	27		
	7	8	9	16	17	18							
Stage 5	1	2	3	10	11	12	19	20	21	23	24	25	
	4	5	6	13	14	15	22	-		26	27	-	
Stage 6	7	8 2	9	16 10	17 11	18 12	19	20	21	23	24	25	
Stage 0	4	5	6	13	14	15	22	20		26	27	25	
	7	8	9	16	17	18				20		+	
Help	,			10	,	Descri	ption						
	Root of	vulneral	bility										
				fault atta	ck which	n exploit	s the fac	t that re	peated	accesses	to DRA	M can	
				in adjace		-							
Defence ID						Defe	nce						
(Card)			1.00			. ,				•			
19 (10)				itoring th					-				
21 (Q)	Prevent	ion Met	nod: Inc	rease mer	nory ret	resn tre	quency,	use Iess	ieaky m	emory te	ecnnolog	ζY	

Attack ID No	Sequen	ice				Des	cription	of Attacl	(					
19	6		n attac	ker installs	a Trojar		_ •			<mark>s operat</mark>	ions (Sid	le-		
		С	hannel	analysis)										
CIST Category	Coun	terfeiti	ng	Informa	tion Lea	kage	Si	abotage		T	amperin	g		
		False			True			False			False			
Attacker		- Adver	-		- Advers	-		3 - Advers	-		4 - Adve	-		
		all group us hacke			academic arch grou			organise ninal gan		_	tate-fund ganisatio			
		ack Leve			ack Level	-		tack Leve			ttack Lev			
	can	wage 1-	2	can	wage 1-3	}	can	wage 1-	3	са	n wage 1	4		
Highest Level		2			3			3			4			
Min Attack		3												
Level			-				_		_		_	_		
Stages	Stag			tage 2		ge 3		ge 4		ge 5		ge 6		
	Sourci	•	•	stem on	_	C ation &		ing &	IC U	sage	кесус	ling IC		
	Desi	RIIS		ip (SoC) egration		mbly	Pack	aging						
Stage Attack			7116	0,40011	7330	<del></del>			Υ	es				
Possible?														
Defences	Cou	nterfei	ting	Inform	nation Le	eakage		Sabotage	9	Т	amperir	ng		
ID No	De	Defence IDs         Defence IDs         Defence IDs           1         2         3         10         11         12         19         20         21         23         24         25												
Stage 1	1	2	3	10	11	12	19	20	21	23	24	25		
	4	5	6	13	14	15	22			26	27			
	7	8	9	16	17	18								
Stage 2	1	2	3	10	11	12	19	20	21	23	24	25		
	4	5	6	13	14	15	22			26	27			
	7	8	9	16	17	18								
Stage 3	1	2	3	10	11	12	19	20	21	23	24	25		
•	4	5	6	13	14	15	22			26	27			
	7	8	9	16	17	18								
Stage 4	1	2	3	10	11	12	19	20	21	23	24	25		
	4	5	6	13	14	15	22			26	27			
Chara E	7	8	9	16	17	18	10	20	24	22	24	25		
Stage 5	4	<u>2</u> 5	3 6	10	11 14	12 15	19 22	20	21	23 26	24 27	25		
	7		9	16	17	18				20	27			
Stage 6	1	2	3	10	11	12	19	20	21	23	24	25		
- 2-0-0	4	5	6	13	14	15	22			26	27	<del></del>		
	7	8	9	16	17	18								
Help						Descri	otion							
	Root of v	/ulneral	bility											
	• (	Correlat	tion bet	ween side	-channel	inform	ation and	d secret (	data bei	ng comp	outed			
Defence ID						Defe	nce							
(Card)	664.5		4	C' I C'			.1.	1		1				
15 (10)			/iethod:	: Side Chan	inel Anal	ysıs - Le	akage re	duction	approac	ines; No	ise injec	tion		
16 (1)	methods		10thad	· Cido Cha-	nol Anal	lucio A-	chitact	ro Ontin	icatios					
16 (J) 17 (Q)				: Side Chan d: Speculat		•		•		nacci Dra	nch tara			
17(0)				a. Speculat ache load	IVE LXEC	ation Al	.cacks - D	ourius ci	ICCK DY	Jass, Did	inch talk	,01		
	,	,												

Attack ID No	Seque	nce				Des	cription	of Attacl	(			
12	7	P	<mark>An attacl</mark>	ker can co	mpromis	se the so	oftware u	ıpdates (	or patch	to add	own	
		f	unction	ality to gai	n contro	l of a sy	stem					
			. 1									
CIST Category	Cou	nterfeit	ing	Informa		kage	Sa	abotage		Т	amperin	g
Attacker	Class 1	False  1 - Adver	rcary		False - Advers	251	Class	True 3 - Advers	carv	Class	False 4 - Adve	rcary
Attacker		all group	-		- Auvers academic	- 1		organise	-		tate-func	-
		ous hack		resea	rch grou	р		ninal gan			ganisatio	
		tack Leve		Atta	ack Level		Att	tack Leve	I		ttack Lev	_
	can	wage 1	-2	can	wage 1-3		can	wage 1-	3	са	n wage 1	-4
Highest Level		2			3			3			4	
Min Attack		2										
Level	Cto	1			Cto	3	Cto	1	Cto		Cto	C
Stages	1	ge 1 cing IP		tage 2		ge 3 C		ge 4		ge 5 Isage		ge 6 ling IC
		igns		tem on p (SoC)	_	etion &		ing & aging	100	sage	Recyc	illig iC
	Des	igii3		gration		mbly	lack	авттв				
Stage Attack				0	1.000	,			Y	es		
Possible?												
Defences	Coi	unterfei	iting	Inform	nation Le	eakage		Sabotage	9	Т	amperir	ıg
ID No	Defence IDs Defence IDs Defence IDs Defence IDs										Ds	
Stage 1	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 2	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 3	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 4	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
Stage 5	7	8 2	9	16 10	17 11	18 12	19	20	21	23	24	25
Stage 5	4	5	6	13	14	15	22	20	21	26	27	25
	7	8	9	16	17	18				20		
Stage 6	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Help						Descri	ption					
	Root of											
	•	Softwar	re updat	es/patche	s (SolarV	Vinds/S	tuxnet)					
Defence ID (Card)						Defe	nce					
20 (J)				Methods	•	•			•		straints;	
	Strict or	ne-way o	commun	ication fro	m IC to	cyber p	hysical sy	stem co	mmand	centre		

Attack ID No	Sequer	nce				Desc	cription	of Attacl	<			
14	8	Aı	n attacl	ker has acc	cess to a	fabricat	ion facili	ity and a	bility to	obtain a	gate-le	vel
		ne	etlist of	the chip t	<mark>hrough i</mark>	everse	<mark>engineer</mark>	ing or ot	ther IP p	iracy me	ethods to	clone c
		th	ie ICs									
CIST Category	Cour	nterfeitir	ng	Informa	tion Lea	kage	Si	abotage		T	amperin	g
CIST Category		True			False			False			False	
Attacker	Class 1	Advers	ary	Class 2	- Advers	ary	Class 3	3 - Adver	sary	Class	4 - Adve	rsary
		all group			academic			organise			tate-fund	
		us hacke			rch grou	p		ninal gan	_		rganisatio	
		ack Level wage 1-2			ack Level wage 1-3			tack Leve wage 1-			ttack Leve n wage 1	
Highest Level	Cuii	2	-	cun	3		Cui	3		<u> </u>	4	-
Min Attack		3										
Level												
Stages	Stag	ge 1	St	tage 2	Sta	ge 3	Sta	ge 4	Sta	ge 5	Sta	ge 6
	Sourc	ing IP	Sys	tem on	l.	С	Test	ing &	IC U	sage	Recyc	ling IC
	Desi	igns	Chi	p (SoC)	Fabrica	ation &	Pack	aging				
			Inte	gration	Asse	mbly						
Stage Attack Possible?												
Defences	Cou	ınterfeit	ing	Inform	nation Le	eakage	!	Sabotage	е		amperir	_
ID No	Defence IDs Defence IDs Defence IDs Defence IDs											
Stage 1	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
C+ 2	7	8	9	16	17	18	10	20	24	22	24	25
Stage 2	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 3	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
Chara A	7	8	9	16	17	18	10	20	24	22	24	25
Stage 4	1	<u>2</u> 5	3 6	10	11	12	19	20	21	23	24	25
	7	8	9	13	14 17	15	22			26	27	
Stage E	1	2	3	16 10	11	18 12	19	20	21	23	24	25
Stage 5	4	5	6	13	14	15	22	20	71	26	27	23
	7	8	9	16	17	18				20		<del>                                     </del>
Stage 6	1	2	3	10	11	12	19	20	21	23	24	25
- 2-0-0	4	5	6	13	14	15	22			26	27	<del></del>
	7	8	9	16	17	18						
Help						Descri	otion					
•	Root of v	vulnerab	ility									
	•	Ease of a	ccess t	o IC black	markets							
			_	ons or law				•				
	•	Technica	l difficu	ulty associ	ated wit			oned chi	ps			
Defence ID						Defe	nce					
(Card)												
5 (9)	Detectio	n Metho	d: Fing	erprinting	: Physica	I Unclo	nable Fu	nctions				

Attack ID No	Seque	nce				Des	cription	of Attacl	k			
7	9	R	ecover	discarded	chips th	en repa	ckaged a	nd sold i	n the m	arket as	new	
	0.			1.6								_
CIST Category	Cou	nterfeiti	ng	Informa		kage	5	abotage		13	amperin	g
Attacker	Class	True			False		Class	False		Class	False	<b>400 M</b>
Attacker		1 - Advers	- 1		- Advers academic	- 1		3 - Advers organise	-		4 - Adve	-
		ous hacke			rch grou			ninal gan			rganisatio	
	At	tack Leve	ı		ack Level	- 1		tack Leve	_		ttack Lev	
	car	wage 1-	2	can	wage 1-3	3	car	wage 1-	3	ca	n wage 1	-4
Highest Level		2			3			3			4	
Min Attack		2										
Level					1		1		1		ı	
Stages		ge 1		age 2		ge 3		ge 4		ge 5	1	ge 6
		ing IP	1	tem on	_	C		ing &	IC U	sage	Recyc	ling IC
	Des	igns		p (SoC)		ation &	Pack	aging				
Stage Attack			inte	gration	Asse	mbly					V	es
Possible?											11	25
Defences	Co	unterfeit	ting	Inform	nation Le	eakage		Sabotage	 e	Т	amperir	ng .
ID No		efence II	•		efence II	_		efence II			efence I	_
Stage 1	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 2	1	2	3	10	11	12	19	20	21	23	24	25
•	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 3	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 4	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 5	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 6	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18	. • •					
Help	Daat of		.:::			Descri	ption					
		vulnerak		emarking t	achnala	aios.						
			•	•		•	ICc lo a	military	arado e	liccontin	und chin	)c)
Defence ID	•	JiiiialC	neu del	nands for	certain t	ypes or Defe		millary	graue, C	iiscontin	ueu ciiip	13)
(Card)						Dele	nce					
3 (7)	Detection	on Meth	od: Fing	erprinting	Conven	tional se	erial num	bers				
4 (8)				erprinting								
5 (9)				erprinting			nable Fu	nctions				
6 10)				erprinting								
,			0	,	0	0 - 19						
	L											

Attack ID No	Sequenc	e				Des	cription	of Attacl	k				
22	10	Aı	n attack	er can col	mpromis	e a cryp	otosyster	n by ana	lysing th	ne time t	aken to		
			1	<mark>ryptograp</mark>			Cache tii	ming att	ack)				
CIST Category		erfeitir	ng	Informa	tion Lea	kage	Sa	abotage		Ta	amperin	g	
cior category		alse			True			False			False		
Attacker	Class 1 -		-		- Advers	- 1		3 - Adver	-		4 - Adve	-	
		l group s hacke			academic arch grou			organise ninal gan			tate-fund ganisatio		
		ck Level			ack Level	-		tack Leve	_		tack Lev		
		vage 1-2		can	wage 1-3			wage 1-		ca	n wage 1	-4	
<b>Highest Level</b>		2			3			3			4		
Min Attack		2											
Level			100		1		1				1		
Stages	Stage			age 2		ge 3		ge 4	1	ge 5		ge 6	
	Sourcir	_	1	em on	_	C		ing &	IC U	sage	Recyc	ling IC	
	Desig	ns	•	(SoC)		ation &	Pack	aging					
Stage Attack			inte	gration	Asse	mbly			V	es			
Possible?										CS			
Defences	Cour	nterfeit	ing	Inform	nation Le	eakage		Sabotag	e	Т	amperir	ng	
ID No		ence II	•		efence II	•		efence I			efence I	•	
Stage 1	1	2	3	10	11	12	19	20	21	23	24	25	
	4	5	6	13	14	15	22			26	27		
	7	8	9	16	17	18							
Stage 2	1	2	3	10	11	12	19	20	21	23	24	25	
	4	5	6	13	14	15	22			26	27		
	7	8	9	16	17	18							
Stage 3	1	2	3	10	11	12	19	20	21	23	24	25	
	4	5	6	13	14	15	22			26	27		
	7	8	9	16	17	18							
Stage 4	1	2	3	10	11	12	19	20	21	23	24	25	
	4	5	6	13	14	15	22			26	27		
	7	8	9	16	17	18							
Stage 5	1	2	3	10	11	12	19	20	21	23	24	25	
	4	5	6	13	14	15	22			26	27		
Stage 6	7	2	9	16 10	17 11	18 12	19	20	21	23	24	25	
Jiage 0	4	5	6	13	14	15	22	20		26	27	23	
	7	8	9	16	17	18				20		+	
Help	, ,			10	17	Descri	ption						
	Root of vi	ulnerab	oility										
			•	of the m	emory a	ccess ti	me on th	e locatio	n of dat	a item b	eing fet	ched	
			-	not it is p									
Defence ID						Defe							
(Card)													
15 (10)	SCA Detection Method: Side Channel Analysis - Leakage reduction approaches; Noise injection methods												

Attack ID No	Sequen	ce				Desc	cription o	of Attacl	<				
28	11		n attac	ker has, co	llected a		<u> </u>			e pair (C	RPs) of t	he IC	
				uses Mach				_					
				rrectly pre	edicts the	e PUF's i	response	es to arbi	itrary ch	allenges	with hig	gh	
		pı	robabil	ity									
CIST Category	Coun	terfeitii	ng	Informa	tion Lea	kage	Sa	abotage		T	amperin	g	
CIST Category		False			True			False			False		
Attacker		- Advers	-		- Advers	-		3 - Adver	-		4 - Adve	-	
		ill group us hacke			academic arch grou			organise ninal gan			tate-fund ganisatio		
		ack Level			ck Level	-		tack Leve	_		tack Lev		
	can	wage 1-2	2	can	wage 1-3	3	can	wage 1-	3	са	n wage 1	-4	
Highest Level		2			3			3			4		
Min Attack		2											
Level Stages	Stag	o 1		tage 2	Sta	ge 3	Sto	ge 4	Sto	ge 5	Star	ge 6	
Jiages	Sourci			tem on		ge 3 C		ge 4 ing &		sage	`	ling IC	
	Desi	_	·	ip (SoC)	_	ation &		aging					
				egration	Asse	mbly							
Stage Attack Possible?									Y	es			
Defences	Cou	nterfeit	ing	Inforn	nation Le	eakage	9	Sabotage	e	Т	amperir	ng	
ID No	De	Defence IDs Defence IDs Defence IDs											
Stage 1	1	2	3	10	11	12	19	20	21	23	24	25	
	4	5	6	13	14	15	22			26	27		
	7	8	9	16	17	18	10	20	24	22	24	25	
Stage 2	1	2	3	10	11	12	19	20	21	23	24	25	
	4	5	6	13	14	15	22			26	27		
	7	8	9	16	17	18							
Stage 3	1	2	3	10	11	12	19	20	21	23	24	25	
	4	5	6 9	13 16	14	15	22			26	27		
Stage 4	7	2	3	10	17 11	18 12	19	20	21	23	24	25	
Stage 4	4	5	6	13	14	15	22	20	21	26	27	23	
	7	8	9	16	17	18							
Stage 5	1	2	3	10	11	12	19	20	21	23	24	25	
	4	5	6	13	14	15	22			26	27		
	7	8	9	16	17	18							
Stage 6	1	2	3	10	11	12	19	20	21	23	24	25	
	4	5	6	13	14	15	22			26	27		
Holn	7	8	9	16	17	18 Doscriu	ntion						
Help	Root of v	ulnersh	nility			Descri	JUUN						
			•	mple henc	e can he	modell	ed using	machine	e learnir	ng algorit	thms		
Defence ID	, , ,	or des	1 <u>5</u> 111331	inpic nenc	C Carr DC	Defe		macmin	- icaiiii	is diguil			
(Card)													
18 (K)	Prevention	on Meth	nod: PU	F Modellir	ng Attacl	ks - Resp	onse Ob	fuscatio	n, Multi	-PUF De	sign		

CIST Category   False   True   Tru	Attack ID No	Seque	nce				Des	cription	of Attacl	k				
False	11	12		Hardwar	e Trojan ir	serted l	y attac	ker into t	he desig	n file				
Attacker   Class 1 - Adversary   As small group of curious hackers   Attack Level   Can wage 1-3   Can wage 1-	CIST Category	Cou	nterfeit	ting	Informa	tion Lea	kage	Sa	abotage		Ta	amperin	g	
A small group of curlous hackers   Attack Level   Can wage 1-3   An organised can wage 1-4	Cist Category					False						True		
Common Series   Common Seri	Attacker			- 1			- 1			-			-	
Attack Level   Can wage 1-2   Can wage 1-3   Can wage 1-3   Can wage 1-4			_	-					_					
Highest Level						_	- 1		_	_		_		
Highest Level													_	
Stage   Stage   Stage   Surcing IP Designs   Designs   Designs   Designs   Stage   System on Chip (Soc) Integration   Chip (Soc)   Fabrication & Fabricati	Highest Level			_									-	
Stage   Stage 1   Stage 2   Stage 3   C   Testing & Packaging   C   Fabrication & Packaging   C   Stage 5   C   Usage   Recycling IC														
Sourcing IP   Designs   Packaging   Pack	Level													
Designs	Stages	Sta	ge 1	St	tage 2	Sta	ge 3	Sta	ge 4	Sta	ge 5	Sta	ge 6	
Stage Attack   Yes   Defence   De		Sour	cing IP	Sys	tem on	ı	С	Test	ing &	IC U	Isage	Recyc	ling IC	
Stage Attack Possible?   Defence		Des	signs	Chi	p (SoC)	Fabric	ation &	Pack	aging					
Possible				Inte	gration	Asse	mbly							
Defences   Counterfeiting   Defence IDs	_	Y	es											
Stage 1												_		
Stage 1														
Stage 2														
Stage 2	Stage 1								20	21			25	
Stage 2				_	_			22			20	2.7		
A	Stage 2			_	_			10	20	21	23	2/	25	
Stage 3	Stage 2							1	20	21			23	
Stage 3								22			26	21		
A														
Table   Stage 4	Stage 3								20	21			25	
Stage 4								22			26	27		
A   5   6   13   14   15   22   26   27	61							10	20	24	22	24	25	
T	Stage 4				_				20	21			25	
Stage 5							1	22			26	21		
4	Stage F				_			10	20	21	22	24	25	
Stage 6  1 2 3 10 11 12 19 20 21 23 24 25  4 5 6 13 14 15 22 2 26 27  7 8 9 16 17 18  Help  Root of vulnerability  Outsourcing of IP development and IC fabrication  High complexity of integrated circuits that makes it harder to detect Trojan  Defence ID (Card)  23 (9)  Prevention Method: Hardware Trojan Insert Replace functional cells to implement an LFSR/MISR-like circuit that generates a digital signature  24 (10)  Prevention Method: Hardware Trojan Insert Pre-silicon detection  25 (J)  Prevention Method: Hardware Trojan Insert Post-silicon detection  Defence (Q)  Detection Method: Hardware Trojan Insert Post-silicon detection	Stage 5								20	21			23	
Stage 6  1 2 3 10 11 12 19 20 21 23 24 25  4 5 6 13 14 15 22 26 27  7 8 9 16 17 18  Help  Root of vulnerability  Outsourcing of IP development and IC fabrication High complexity of integrated circuits that makes it harder to detect Trojan  Defence ID (Card)  23 (9) Prevention Method: Hardware Trojan Insert Replace functional cells to implement an LFSR/MISR-like circuit that generates a digital signature  24 (10) Prevention Method: Hardware Trojan Insert Pre-silicon detection  25 (J) Prevention Method: Hardware Trojan Insert Post-silicon detection  Defence  Defence  Outsourcing of IP development and IC fabrication  Topic III (Fabrication III)  Defence ID (Card)  Outsourcing of IP development and IC fabrication  Topic III (Fabrication III)  Defence ID (Card)  Outsourcing of IP development and IC fabrication  Topic III (Fabrication III)  Defence ID (Card)  Outsourcing of IP development and IC fabrication  Topic III (Fabrication III)  Defence ID (Card)  Outsourcing of IP development and IC fabrication  Topic III (Fabrication III)  Outsourcing of IP development and IC fabrication  Topic III (Fabrication III)  Defence ID (Card)  Outsourcing of IP development and IC fabrication  Topic III (Fabrication III)  Outsourcing of IP development and IC fabrication  Topic III (Fabrication III)  Outsourcing of IP development and IC fabrication  Topic III (Fabrication III)  Outsourcing of IP development and IC fabrication  Topic III (Fabrication III)  Outsourcing of IP development and IC fabrication  Topic III (Fabrication III)  Outsourcing of IP development and IC fabrication  Topic III (Fabrication III)  Outsourcing of IP development and IC fabrication  Topic III (Fabrication III)  Outsourcing of IP development and IC fabrication  Topic III (Fabrication III)  Outsourcing of IP development and IC fabrication  Topic III (Fabrication III)  Outsourcing of IP development and IC fabrication  Topic III (Fabrication III)  Outsourcing of IP development and IC fabrication  Outsourcing of IP development and IC fabrication  Outsourcing of					_						20	21		
4 5 6 13 14 15 22 26 27  7 8 9 16 17 18  Help  Bescription  Root of vulnerability  Outsourcing of IP development and IC fabrication High complexity of integrated circuits that makes it harder to detect Trojan  Defence ID (Card)  23 (9) Prevention Method: Hardware Trojan Insert Replace functional cells to implement an LFSR/MISR-like circuit that generates a digital signature  Prevention Method: Hardware Trojan Insert Pre-silicon detection  25 (J) Prevention Method: Hardware Trojan Insert Post-silicon detection  26 (Q) Detection Method: Hardware Trojan Insert	Stage 6			_				19	20	21	23	24	25	
Help  Root of vulnerability  Outsourcing of IP development and IC fabrication High complexity of integrated circuits that makes it harder to detect Trojan  Defence ID (Card)  23 (9) Prevention Method: Hardware Trojan Insert Replace functional cells to implement an LFSR/MISR-like circuit that generates a digital signature  Prevention Method: Hardware Trojan Insert Pre-silicon detection  25 (J) Prevention Method: Hardware Trojan Insert Post-silicon detection  Defence	Juge													
Help  Root of vulnerability  Outsourcing of IP development and IC fabrication High complexity of integrated circuits that makes it harder to detect Trojan  Defence ID (Card)  23 (9) Prevention Method: Hardware Trojan Insert Replace functional cells to implement an LFSR/MISR-like circuit that generates a digital signature  Prevention Method: Hardware Trojan Insert Pre-silicon detection  25 (J) Prevention Method: Hardware Trojan Insert Post-silicon detection  Description  Defence  Defen					_			† - <del>-</del>						
Root of vulnerability  Outsourcing of IP development and IC fabrication High complexity of integrated circuits that makes it harder to detect Trojan  Defence ID (Card)  Prevention Method: Hardware Trojan Insert Replace functional cells to implement an LFSR/MISR-like circuit that generates a digital signature  Prevention Method: Hardware Trojan Insert Pre-silicon detection  Prevention Method: Hardware Trojan Insert Post-silicon detection  Defence  Outsourcing of IP development and IC fabrication  Defence  Defence  Outsourcing of IP development and IC fabrication  Defence  Defence  Outsourcing of IP development and IC fabrication  Outsourcing of IP development and IC fabrication  Outsourcing of IP development and IC fabrication  Outsourcing o	Help							ption		1	1			
<ul> <li>High complexity of integrated circuits that makes it harder to detect Trojan</li> <li>Defence ID (Card)</li> <li>23 (9) Prevention Method: Hardware Trojan Insert Replace functional cells to implement an LFSR/MISR-like circuit that generates a digital signature</li> <li>24 (10) Prevention Method: Hardware Trojan Insert Pre-silicon detection</li> <li>25 (J) Prevention Method: Hardware Trojan Insert Post-silicon detection</li> <li>26 (Q) Detection Method: Hardware Trojan Insert</li> </ul>		Root of	vulnera	bility										
Defence ID (Card)  23 (9) Prevention Method: Hardware Trojan Insert Replace functional cells to implement an LFSR/MISR-like circuit that generates a digital signature  24 (10) Prevention Method: Hardware Trojan Insert Pre-silicon detection  25 (J) Prevention Method: Hardware Trojan Insert Post-silicon detection  26 (Q) Detection Method: Hardware Trojan Insert		•	Outsou	ircing of	IP develop	ment ar	nd IC fab	rication						
(Card)  23 (9) Prevention Method: Hardware Trojan Insert Replace functional cells to implement an LFSR/MISR-like circuit that generates a digital signature  24 (10) Prevention Method: Hardware Trojan Insert Pre-silicon detection  25 (J) Prevention Method: Hardware Trojan Insert Post-silicon detection  26 (Q) Detection Method: Hardware Trojan Insert		•	High co	mplexity	of integra	ated circ	uits tha	t makes i	t harder	to dete	ct Trojar	1		
23 (9) Prevention Method: Hardware Trojan Insert Replace functional cells to implement an LFSR/MISR-like circuit that generates a digital signature  24 (10) Prevention Method: Hardware Trojan Insert Pre-silicon detection  25 (J) Prevention Method: Hardware Trojan Insert Post-silicon detection  26 (Q) Detection Method: Hardware Trojan Insert							Defe	nce						
Replace functional cells to implement an LFSR/MISR-like circuit that generates a digital signature  24 (10) Prevention Method: Hardware Trojan Insert Pre-silicon detection  25 (J) Prevention Method: Hardware Trojan Insert Post-silicon detection  26 (Q) Detection Method: Hardware Trojan Insert		Prevent	ion Me	thod: Ha	rdware Tro	ojan Inse	ert							
Pre-silicon detection  25 (J) Prevention Method: Hardware Trojan Insert Post-silicon detection  26 (Q) Detection Method: Hardware Trojan Insert		I				-		SR-like c	ircuit tha	at gener	ates a di	gital sigr	nature	
25 (J) Prevention Method: Hardware Trojan Insert Post-silicon detection 26 (Q) Detection Method: Hardware Trojan Insert	24 (10)													
Post-silicon detection 26 (Q) Detection Method: Hardware Trojan Insert		Pre-silio	on dete	ection										
26 (Q) Detection Method: Hardware Trojan Insert	25 (J)	Prevent	ion Me	thod: Ha	rdware Tro	ojan Inse	ert							
	26 (Q)				dware Tro	jan Insei	t							
Runtime detection		Runtim	e detec	tion										

Attack ID No	Seque	nce				Des	cription	of Attacl	<b>(</b>			
17	13	Aı	n attac	ker uses a	Rowham	mer te	chniques	to unde	<mark>rmine t</mark>	he integ	rity of	
		el	ectron	ics systems	by facil	itating <mark>a</mark>	<mark>an elevat</mark>	<mark>ion of pr</mark>	ivilege a	attack		
CIST Category	Cour	nterfeitir	ng	Informa	tion Lea	kage	Sa	abotage		T	amperin	g
CIST Category		False			False			True			False	
Attacker		L - Advers	-		- Advers	-		3 - Adver	-		4 - Adve	-
		all group			cademic			organise			tate-fund	
		ous hacke ack Level	_		irch grou ack Level	p		ninal gan tack Leve	_		rganisatio ttack Leve	
		wage 1-2			wage 1-3			wage 1-			n wage 1	
Highest Level		2	-		3			3			4	-
Min Attack		2										
Level												
Stages	Sta	ge 1	S	tage 2	Sta	ge 3	Sta	ge 4	Sta	ge 5	Sta	ge 6
	Sourc	ing IP	Sys	tem on	ı	c	Test	ing &	IC U	sage	Recyc	ling IC
	Des	igns	Ch	ip (SoC)	Fabrica	ation &	Pack	aging				
			Inte	egration	Asse	mbly						
Stage Attack												
Possible?												
Defences		Counterfeiting Information Leakage Sabotage Tampering Defence IDs Defence IDs Defence IDs										
ID No				10								
Stage 1		Defence IDs           1         2         3           4         5         6			11	12	19	20	21	23	24	25
				13	14	15	22			26	27	
<u> </u>	7	8	9	16	17	18	10	20	24	20	2.4	25
Stage 2	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 3	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 4	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 5	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
6: 5	7	8	9	16	17	18	10	20	24	20	2.	25
Stage 6	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
11-1	7	8	9	16	17	18						
Help	Doot of	ما میں میں ا	:1:4			Descri	ption					
		vulnerab	•	ctructure	and fabr	ication	tochnolo	av.				
Defence ID	•	DKAIVI PI	iysical	structure a	anu rabr	Defe		RA				
						Dere	nce					
(Card) 21 (Q)	Dreven+	ion Meth	nod: Ind	rease mer	nory ref	resh fro	allency i	عما معد	leaky m	emory to	chnolog	f\/
21 (U)	rieveiil	וטוו ועופנו	iou. III	i case iiiei	nory ren	icon ne	quericy,	use 1622	icaky III	emory te	ciliolog	, у

Attack ID No	Seque	nce				Des	cription (	of Attacl	k			
20	14			ker can bre							•	on the
				ichine, wh				opy sens	sitive da	ta from a	a victim	
				<mark>Speculativ</mark>								
CIST Category	Cou	nterfeiti	ing	Informa		kage	Sa	abotage		Ta	amperin	g
cior category		False			True			False			False	
Attacker		1 - Adver	-		- Advers	- 1		3 - Adver	-		4 - Adve	-
		all group			academic			organise			tate-fund	
		ous hacke tack Leve			arch grou ack Level	- 1		ninal gan tack Leve	_		ganisation tack Lev	
		wage 1-			wage 1-3			wage 1-			n wage 1	_
Highest Level	- cu.	2	_		3			3			4	<u> </u>
Min Attack		3										
Level		J										
Stages	Sta	ge 1	S	tage 2	Sta	ge 3	Sta	ge 4	Sta	ge 5	Sta	ge 6
o tages		ing IP		tem on		C		ing &		sage		ling IC
		igns	-	ip (SoC)	Fabrica	ation &		aging		6-		
		0		egration		mbly						
Stage Attack	Yes											
Possible?												
Defences	Counterfeiting Information Leakage Sabotage Tampering											
ID No	Defence IDs Defence IDs Defence IDs											
Stage 1	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 2	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 3	1	2	3	10	11	12	19	20	21	23	24	25
Juage 3	4	5	6	13	14	15	22	20	21	26	27	25
	7	8	9	16	17	18				20	27	
Stage 4	1	2	3	10	11	12	19	20	21	23	24	25
Juge 4	4	5	6	13	14	15	22	20		26	27	25
	7	8	9	16	17	18				20	27	
Stage 5	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22	25		26	27	-
	7	8	9	16	17	18				20		
Stage 6	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22		<del></del>	26	27	
	7	8	9	16	17	18	_ <del></del>					
Help	,					Descri	ption					
- 1	Root of	vulnera	bility				•					
			•	erations ca	n affect	the mic	ro-archit	ectural s	state, su	ch as inf	ormatio	n
		•		ation Look								
				vhen comb		-	-			•		_
Defence ID						Defe						
(Card)												
15 (10)	SCA Det	ection N	Vethod:	Side Chan	nel Anal	ysis - Le	eakage re	duction	approad	ches; No	ise injec	tion
	method	s										
16 (J)	SCA Det	ection N	Method:	Side Chan	nel Anal	ysis - A	rchitectu	re Optin	nisation			
17 (Q)	SCA Pre	vention	Method	d: Speculat	ive Exec	ution A	ttacks - B	ounds c	heck by	oass; Bra	nch targ	get
	injectio	n; Rogue	e data ca	ache load								

Attack ID No	Sequence Description of Attack  An attacker is able to recycle ICs and repackage them as new IC and able to pass											
25	15	A	<mark>An attacl</mark>	cer is able	to recyc	le ICs an	ıd repacl	kage the	m as ne	w IC and	able to	pass
		ŗ	<mark>ohysical i</mark>	nspection								
CIST Category	Cou	nterfeit	ing	Informa	tion Lea	kage	S	abotage		T	amperin	g
cist category		True			False			False			False	
Attacker		1 - Adve	-		- Advers	-		3 - Adver	-		4 - Adve	-
		nall grou <sub>l</sub> ous hack			academic arch grou			organise ninal gan			tate-fund rganisatio	
		tack Leve			ack Level	•		tack Leve	_		ttack Lev	
		n wage 1			wage 1-3			wage 1-			n wage 1	•
Highest Level		2			3			3			4	
Min Attack		2										
Level												
Stages		ge 1		age 2		ge 3		ge 4		ge 5		ge 6
		cing IP	-	tem on	_	C		ing &	IC U	sage	Recyc	ling IC
	Des	signs		p (SoC)		ation &	Pack	aging				
Stage Attack			Inte	gration	Asse	mbly					V	es
Stage Attack Possible?											Y	CS
Defences	Co	unterfei	iting	Inform	nation Le	eakage		Sabotag	 P	1	Tamperir	าย
ID No		efence	U		efence I	•		efence I			efence I	_
Stage 1	1	1 2 3 4 5 6			11	12	19	20	21	23	24	25
_	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 2	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 3	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 4	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 5	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22	-		26	27	
Store 6	7	8	9	16	17	18	10	20	21	22	24	25
Stage 6	4	5	6	10	11 14	12 15	19 22	20	21	23 26	27	25
	7	8	9	16	17	18		<del>                                     </del>		20	21	<del>                                     </del>
Help				1 10		Descri	otion				1	
	Root of	vulnera	bility									
	•		•	emarking t	echnolo	gies						
	•			nands for			ICs (e.g.	military	grade, c	discontin	ued chip	os)
Defence ID (Card)						Defe		·			·	
2 (6)	Detecti	on Meth	nod: Phv	sical Inspe	ction: X-	Ray Inst	ection:	Visual In	spection	າ		
,						, 1	,		•			
							-					

Attack ID No	Seque	nce				Des	cription	of Attacl	(			
16	16	Α	n attacl	cer has Ac	cess to P	UF resp	onse/cha	allenge p	airs and	d can cor	<mark>nplete a</mark>	PUF
				<mark>g attack (F</mark>			-					
CIST Category	Cou	nterfeiti	ng	Informa		kage	Sa	abotage		T	amperin	g
	-	False			True			False			False	
Attacker		1 - Adver			- Advers	-		3 - Adver	-		4 - Adve	-
		all group			academic arch grou			organise ninal gan			tate-fund ganisatio	
		tack Leve			ack Level	-		ack Leve	_		ttack Lev	
	car	wage 1-	2	can	wage 1-3	,	can	wage 1-	3	са	n wage 1	-4
Highest Level		2			3			3			4	
Min Attack		2										
Level					1						I	
Stages		ge 1		tage 2		ge 3		ge 4		ge 5	1	ge 6
		ing IP		tem on	_	C		ing &	IC U	sage	Recyc	ling IC
	Des	igns		p (SoC)		ation &	Раск	aging				
Stage Attack			inte	gration	Asse	mbly			V	es		
Possible?									'	<b>C</b> 3		
Defences	Co										amperir	ıg
ID No	D	efence I		D	<mark>efence I</mark>	Ds	D	efence II	Ds	D	efence I	Ds
Stage 1	1	Defence IDs           1         2         3           4         5         6			11	12	19	20	21	23	24	25
				13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 2	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 3	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 4	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
C:	7	8	9	16	17	18	10	20	24	22	24	25
Stage 5	1	2 5	3 6	10	11	12	19	20	21	23	24	25
	4 7	8	9	13 16	14 17	15 18	22			26	27	<del>                                     </del>
Stage 6	1	2	3	10	11	12	19	20	21	23	24	25
Juge 0	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18				20		
Help	,			1 20		Descri	ption					
	Root of	vulneral	oility									
	•		-	mple henc	e can be	model	ed using	machine	e learnin	ng algori	thms	
Defence ID (Card)				•		Defe						
18 (K)	Prevent	ion Met	hod: PU	F Modellir	ng Attacl	ks - Res <sub>l</sub>	onse Ob	fuscatio	n, Multi	-PUF De	sign	

Attack ID No	Sequen	ce				Desc	cription	of Attacl	k			
24	17			er can cre					_			
				eak the cr	yptogra	phic fun	ctions cr	eate una	authoriz	ed signa	tures an	d clone
		t	he devic	е								
	Coun	terfeiti	inσ	Informa	tion Lea	kage	S:	abotage		T:	amperin	σ
CIST Category		True	116		False	Rage	<u> </u>	False			False	5
Attacker	Class 1		sarv		- Advers	arv	Class	3 - Adver	sarv	Class	4 - Adve	rsarv
Attacker		II group	-		academic	-		organise	-		tate-func	-
		us hack			arch grou			ninal gan			ganisatio	
	Atta	ck Leve	el	Atta	ack Level		Att	tack Leve	ı	At	tack Lev	el
	can	wage 1-	2	can	wage 1-3	3	can	wage 1-	3	са	n wage 1	-4
Highest Level		2			3			3			4	
Min Attack		2										
Level												
Stages	Stag			age 2		ge 3		ge 4		ge 5	,	ge 6
	Sourci	_	1 -	tem on	-	C		ing &	IC U	Isage	Recyc	ling IC
	Desig	gns		p (SoC)		ation &	Pack	aging				
Ctoro Attori			Inte	gration	Asse	mbly			\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \			
Stage Attack Possible?									Y	es		
Defences	Cour	nterfei	ting	Inform	nation L	nakago		Sabotag	0	т.	amperir	200
ID No		fence I	_		efence I	_		efence I			ampem efence I	_
Stage 1	1	2	3	10	11	12	19	20	21	23	24	25
Juge 1	4	5	6	13	14	15	22	20	21	26	27	25
	7	8	9	16	17	18				20	27	
Stage 2	1	2	3	10	11	12	19	20	21	23	24	25
	4	 5	6	13	14	15	22			26	27	
	7	8	9	16	17	18				20	27	
Store 2	1	2	3	10	11	12	19	20	21	23	24	25
Stage 3	4	5	6	13	14	15	22	20	21	26	27	23
	7	8	9	16	17	18	22			20	21	
Stage 4	1	2	3	10	11	12	19	20	21	23	24	25
Stage 4	4	5	6	13	14	15	22	20	21	26	27	23
	7	8	9	16	17	18						
Stage 5	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	_
	7	8	9	16	17	18						
Stage 6	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Help						Descri	otion					
	Root of v	ulneral	bility									
	• (	Correlat	tion betv	ween side	-channel	linforma	ation and	d secret	data bei	ing comp	uted	
Defence ID						Defe	nce					
(Card)												
1 (5)	Detection	n Meth	od: Side	Channel A	Analysis	Differen	tial Pow	er Analy	sis (DPA	١)		

Attack ID No	Seque	nce				Des	cription	of Attacl	<			
27	18		A malicio	us recyclii	ng centr					new and	d can be	used
			as ICs are	e not chip	locked							
CIST Category	Cou	nterfei	iting	Informa	tion Lea	kage	S	abotage		T	amperin	g
		True			False			False			False	
Attacker		1 - Adv	-		- Advers	- 1		3 - Adver	-		4 - Adve	-
		nall grou	-		academic arch grou			organise ninal gan			tate-fund ganisatio	
		tack Le			ack Level	-		tack Leve	_		tack Lev	
	caı	n wage	1-2	can	wage 1-3	1	car	wage 1-	3	са	n wage 1	-4
Highest Level		2			3			3			4	
Min Attack		3										
Level	_				_		_				_	_
Stages		ge 1		tage 2		ge 3		ge 4		ge 5		ge 6
		cing IP signs		tem on	· -	C ation &		ing &	lc u	Isage	кесус	ling IC
	Des	oigi15		ip (SoC) egration		mbly	Pack	aging				
Stage Attack			11100	Place	7330	viy					Y	es
Possible?												
Defences	Co	unterf	eiting	Inform	nation L	eakage	9	Sabotage	e	Т	amperir	ng
ID No	D	efence	IDs	D	efence I	Ds	D	efence II	Ds	D	efence I	Ds
Stage 1	1	2	3	10 13	11	12	19	20	21	23	24	25
		1 2 3 4 5 6 7 8 9			14	15	22			26	27	
				16	17	18						
Stage 2	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 3	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
61	7	8	9	16	17	18	10	20	24	22	24	25
Stage 4	1	2	3	10	11	12	19	20	21	23	24	25
	7	5 8	9	13 16	14 17	15 18	22			26	27	<del>                                     </del>
Stage 5	1	2	3	10	11	12	19	20	21	23	24	25
Juge 3	4	5	6	13	14	15	22	20		26	27	25
	7	8	9	16	17	18	<del> </del>					<del>                                     </del>
Stage 6	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Help						Descri	ption					
	Root of		-						_			_
	•			nip/packag	ge/syster	n level t	ests are	often in	adequat	e in dete	ecting va	rious
			of counte		n nat at	tracti::-	duc += =	ianifica	+ dosi	offort		
Defence ID	•	ic auti	nenticatio	on are ofte	n not at	tractive Defe		ignitican	ι uesign	enort		
(Card)						Dele	nce					
8 (Q)	Prevent	tion Me	ethod: An	ti-fuse-Bas	sed Pack	age-Lev	el Defen	ce				
5 (4)								- <del>-</del>				

Attack ID No	Seque	nce				Des	cription o	of Attacl	<			
23	19			ker can mo								-
				ns are run	_	_			_		ion whic	:h
				sult in the	<u> </u>				promise			
CIST Category	Cou	nterfeit	ing	Informa		kage	Sa	abotage		T	amperin	g
		False			True		<u> </u>	False			False	
Attacker		1 - Adver all group	_		- Advers academic	-		3 - Advers organise	-		4 - Adve	-
		ous hack			arch grou			ninal gan		_	ganisatio	
		tack Leve			ack Level	r		ack Leve	_		ttack Lev	
	car	wage 1	-2	can	wage 1-3		can	wage 1-	3	са	n wage 1	-4
Highest Level		2			3			3			4	
Min Attack		2										
Level							_		_	_	_	_
Stages		ge 1		age 2		ge 3		ge 4		ge 5		ge 6
		ing IP	1 -	tem on p (SoC)	_	C ation &		ing &	100	Isage	кесус	ling IC
	Des	igns		gration		mbly	Pack	aging				
Stage Attack			IIICC	gration	A33C	шыу			V	'es		
Possible?										23		
Defences	Co	unterfei	ting	Inform	nation Le	eakage	9	Sabotage	е	Т	amperir	ng
ID No	D	efence I	Ds	D	efence II	Ds	D	efence II	Ds	D	efence I	Ds
Stage 1	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 2	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 3	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 4	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 5	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
Store C	7	8	9	16	17	18	10	30	24	1 22	24	25
Stage 6	1	2 5	3 6	10	11	12 15	19 22	20	21	23 26	24 27	25
	7	8	9	13 16	14 17	18				20	21	
Help	,	O	<u> </u>	10	1/	Descri	ntion					
ПСІР	Root of	vulnera	bilitv			Descri	Puon					
			•	ween side	-channel	inform	ation and	d secret	data bei	ing com	outed	
Defence ID						Defe				<u> </u>		
(Card)												
15 (10)	SCA Det	ection N	Vethod:	Side Chan	nel Anal	ysis - Le	eakage re	duction	approa	ches; No	ise injec	tion
	method	ls										

Attack ID No	Seque	ence				Des	cription	of Attacl	<b>(</b>			
9	20		Remote (	CLKSCREW	<mark>/ (read a</mark>		•			oits the s	ecurity (	of
		•	<mark>energy m</mark>	nanageme	nt systei	ms in ICs	to com	oromise	the syst	em's ava	ailability	
CIST Category	Cou	nterfeit	ing	Informa		kage	S	abotage		T	amperin	g
	Class	False			False		Class	True		Class	False	
Attacker		1 - Adve nall grou	-		- Advers academic	-		3 - Advers organise	-		4 - Adve	-
		ous hack	-		arch grou			ninal gan			rganisatio	
	At	tack Lev	el		ack Level	-		tack Leve	_		ttack Lev	
	caı	n wage 1	2	can	wage 1-3	3	car	wage 1-	3	са	n wage 1	-4
Highest Level		2			3			3			4	
Min Attack Level		3										
Stages	Sta	ige 1	St	age 2	Sta	ge 3	Sta	ge 4	Sta	ge 5	Sta	ge 6
Stages		cing IP		tem on		C		ing &		sage		ling IC
	De	signs	Chi	p (SoC)	Fabric	ation &	Pack	aging			-	
			Inte	gration	Asse	mbly						
Stage Attack Possible?									Y	es		
Defences	Co	unterfe	iting	Sabotago	е	T	amperir	ng				
ID No	D	efence	_	10	efence I			<mark>efence I</mark>			efence I	
Stage 1	1	Defence IDs           1         2         3           4         5         6			11	12	19	20	21	23	24	25
	-			13	14	15	22			26	27	
Ctoro 2	7	8	9	16	17	18	10	20	21	22	24	25
Stage 2	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 3	1	2	3	10	11	12	19	20	21	23	24	25
	7	5 8	6	13 16	14 17	15 18	22			26	27	
Stage 4	1	2	3	10	11	12	19	20	21	23	24	25
Stage 4	4	5	6	13	14	15	22	20	21	26	27	23
	7	8	9	16	17	18						
Stage 5	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 6	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Help	Doot of		la ilia.			Descri	ption					
	ROOT OF	vulnera	•	wara acco	ss to on	orau ma	nagamai	at bardu	aro			
				ware acce Irdware re			_			iency na	st the	
		•	ing limits		guiatuis	י נט טכ מ	νιε το μι	isii VUILd	<sub>Б</sub> е/ п еці	acticy po	ואנ נווכ	
	•	•	_	power do	main ac	ross sec	urity boเ	ındaries				
Defence ID				, , , , , ,		Defe						
(Card)												
22 (K)	Prevent	tion or [	Detection	Methods	: Tampe	r-Proof	Design					

CLIST Category	Attack ID No	Seque	nce				Des	cription	of Attac	k			
CIST Category	13	21		Attack is	able to ins	sert Troj	an in the	e RTL cod	de, durin	g the sy	stem int	egration	or
Class 1 - Adversary   A small group of curious hackers   Attack Level can wage 1-3				during th	ie manufa	cturing o	of the In	tegrated	Circuit (	IC)			
Class 1 - Adversary   A small group of curious hackers   Attack Level can wage 1-3				ı									
Attacker   Class 1 - Adversary   As a cademic   research group   Attack Level   can wage 1-3   Attack Level   can wage 1-4	CIST Category	Cou	nterfei	ting	Informa	tion Lea	kage	S			T	amperin	g
A small group of curlous hackers													
Curious hackers   Can wage 1-2   Can wage 1-3   Can wage 1-3   Can wage 1-4   Can wage 1-3   Can wage 1-3   Can wage 1-4   Can wage 1-3   Can wage 1-4   Can wage 1-4   Can wage 1-3   Can wage 1-4	Attacker			- 1			- 1			-			-
Attack Level   Can wage 1-3			_	-					_		_		
Highest Level   Z   S   Stage 1   Stage   S												_	
Stage   Stage 1   Stage 2   Stage 3   Stage 4   Stage 5   Stage 6   Recycling IC		cai	n wage :	1-2	can	wage 1-3	3	car	wage 1-	3	ca	n wage 1	-4
Stage   Stage   Stage   System on Chip (SoC)   Integration   Chip (SoC)	Highest Level		2			3			3			4	
Stage   Stage   Stage   Stage   Stage   Stage   Stage   Testing & Packaging   Testing & Testing & Packaging   Testing & Testing & Packaging   Testing & Te	Min Attack		3										
Sourcing IP   Designs   Posigns	Level												
Stage Attack   Possible?   Stage 1	Stages		_		_		~		_		~		~
Stage Attack   Possible?   Stage Attack   Possible?   Stage 1   Stage   Sta			_			-	_		_	IC U	sage	Recyc	ling IC
Stage Attack Possible?   Stage   St		Des	signs		• • •			Pack	aging				
Possible?	Stage Attack												
Defence	_	True											
Stage 1		Counterfeiting Information Leakage Sabotage Tampering											
Stage 2				_			_		_			-	_
Stage 2	Stage 1	1	2	3	10	11	12	19	20	21	23	24	25
Stage 2	_	4	5	6	13	14	15	22			26	27	
A		7	8	9	16	17	18						
Stage 3	Stage 2	1	2	3	10	11	12	19	20	21	23	24	25
Stage 3		4	5	6	13	14	15	22			26	27	
A		7	8	9	16	17	18						
A   5   6   13   14   15   22   26   27	Stage 3	1	2	3	10	11	12	19	20	21	23	24	25
Stage 4		4	5	6	13	14	15	22			26	27	
4		7	8	9	16	17	18						
Stage 5	Stage 4	1	2	3	10	11	12	19	20	21	23	24	25
Stage 5		4	5	6	13	14	15	22			26	27	
4		7	8	9	16	17	18						
Stage 6  The stage 6 is a stage	Stage 5								20	21			25
Stage 6  1 2 3 10 11 12 19 20 21 23 24 25  4 5 6 13 14 15 22 26 27  7 8 9 16 17 18					_			22			26	27	
4 5 6 13 14 15 22 26 27  7 8 9 16 17 18  Help  Boot of vulnerability  Outsourcing of IP development and IC fabrication  High complexity of integrated circuits that makes it harder to detect Trojan  Defence ID  Prevention Method: Hardware Trojan Insert Replace functional cells to implement an LFSR/MISR-like circuit that generates a digital signature  24 (10)  Prevention Method: Hardware Trojan Insert Pre-silicon detection	-							1.5		2.5	25		
The Prevention Method: Hardware Trojan Insert Replace functional cells to implement an LFSR/MISR-like circuit that generates a digital signature  Prevention Method: Hardware Trojan Insert Replace functional cells to implement an LFSR/MISR-like circuit that generates a digital signature  Pre-silicon detection	Stage 6								20	21		-	25
Help  Root of vulnerability  Outsourcing of IP development and IC fabrication  High complexity of integrated circuits that makes it harder to detect Trojan  Defence ID  Defence  23 (9)  Prevention Method: Hardware Trojan Insert Replace functional cells to implement an LFSR/MISR-like circuit that generates a digital signature  Prevention Method: Hardware Trojan Insert Pre-silicon detection								22			26	2/	-
Root of vulnerability  Outsourcing of IP development and IC fabrication  High complexity of integrated circuits that makes it harder to detect Trojan  Defence ID  Prevention Method: Hardware Trojan Insert Replace functional cells to implement an LFSR/MISR-like circuit that generates a digital signature  Prevention Method: Hardware Trojan Insert Pre-silicon detection	Lale	/	8	9	16	1/		ntion					
<ul> <li>Outsourcing of IP development and IC fabrication         <ul> <li>High complexity of integrated circuits that makes it harder to detect Trojan</li> </ul> </li> <li>Defence ID</li></ul>	пеір	Poot of	vulnor	ahility			Descri	ption					
<ul> <li>High complexity of integrated circuits that makes it harder to detect Trojan</li> <li>Defence ID Defence</li> <li>23 (9) Prevention Method: Hardware Trojan Insert         Replace functional cells to implement an LFSR/MISR-like circuit that generates a digital signature</li> <li>24 (10) Prevention Method: Hardware Trojan Insert         Pre-silicon detection</li> </ul>				•	IP develor	ment ar	nd IC fah	rication					
Defence ID  23 (9) Prevention Method: Hardware Trojan Insert Replace functional cells to implement an LFSR/MISR-like circuit that generates a digital signature  24 (10) Prevention Method: Hardware Trojan Insert Pre-silicon detection				_	-				it harder	to dete	ct Troia	า	
23 (9) Prevention Method: Hardware Trojan Insert Replace functional cells to implement an LFSR/MISR-like circuit that generates a digital signature  24 (10) Prevention Method: Hardware Trojan Insert Pre-silicon detection	Defence ID		i ligii ci	ompient	, or micegi	accu cii c			it naruel	to dete	et 110jai		
Replace functional cells to implement an LFSR/MISR-like circuit that generates a digital signature  24 (10) Prevention Method: Hardware Trojan Insert Pre-silicon detection		Prevent	tion Me	thod: Ha	rdware Tr	ojan Inse							
24 (10) Prevention Method: Hardware Trojan Insert Pre-silicon detection		l				-		SR-like c	ircuit tha	at gener	ates a di	gital sigi	nature
Pre-silicon detection	24 (10)												
25 (I) Prevention Method: Hardware Trojan Insert	, ,	l				-							
25 (3) Trevention Method. Hardware Trojan insert	25 (J)	Prevent	tion Me	thod: Ha	rdware Tr	ojan Inse	ert						
Post-silicon detection		Post-sil	icon de	tection									
26 (Q) Detection Method: Hardware Trojan Insert	26 (Q)				dware Tro	jan Insei	τ						
Runtime detection		Runtim	e detec	tion									

Attack ID No	Seque	nce				Des	cription	of Attac	k			
30	22			ker can rep			vare imag	ges with	malicio	us image	es or mal	ke
				ns to exist								
CIST Category	Cou	nterfeit	ing	Informa	tion Lea	kage	S	abotage		T	amperin	g
Ci31 Category		False			False			True			False	
Attacker		1 - Adver	-		- Advers	- 1		3 - Adver	-		4 - Adve	-
		all group			academic			organise			tate-fund	
		ous hack			rch grou	- 1		ninal gan	_		rganisatio	
		tack Leve 1 wage 1			ack Level wage 1-3			tack Leve wage 1-			ttack Lev n wage 1	
Highest Level	Cai	2	-2	Can	3	<u> </u>	Cai	3	5	Ca	4	
Min Attack		2										
Level		_										
Stages	Sta	ge 1	St	age 2	Sta	ge 3	Sta	ge 4	Sta	ge 5	Sta	ge 6
otubes		cing IP		tem on		C		ing &		lsage		ling IC
		signs		p (SoC)	_	ation &		aging		Jugo	1100,0	
				gration	Asse	mbly		-00				
Stage Attack				<u> </u>		es ,	Υ	es	Y	es		
Possible?												
Defences	Co	unterfei	iting	Inform	nation Le	eakage		Sabotag	e	T	amperir	ng
ID No	D	efence I	IDs	D	efence I	Ds	D	efence I	Ds	D	efence I	Ds
Stage 1	1	1 2 3 4 5 6			11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 2	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 3	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 4	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 5	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 6	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Help			1 111			Descri	ption					
	Root of		•									
	•	The firn	nware is	not signe	d, or inte	egrity ch	necked by	/ trusted	l elemer	nt on the	compoi	nent
Defence ID						Defe	nco					
(Card)						Dere	rice					
22 (K)	Prevent	ion or D	etection	Methods	: Tamne	r-Proof	Design					
22 (11)					. rampe		203611					

Attack ID No	Seque	nce				Des	cription o	of Attacl	(			
29	23			ker in the u			•		•			
			_	as by mai		-	ront-end	d-of-line	(FEOL) I	ayers ar	id back-e	nd-of-
	_			L) in same								
CIST Category	Cou	nterfeit	ing	Informa		kage	Sa	botage		Т	amperin	g
	Class	False			True		Class (	False		Class	False	
Attacker		1 - Adve	-		- Adversa academic	-		3 - Advers organise	-		4 - Adve	-
		ous hack			rch grou			ninal gan			rganisatio	
	At	tack Lev	el		ack Level	-		ack Leve	_		ttack Lev	
	car	wage 1	-2	can	wage 1-3	3	can	wage 1-	3	ca	n wage 1	-4
Highest Level		2			3			3			4	
Min Attack Level		3										
Stages	Sta	ge 1	Cı	age 2	Star	ge 3	Sta	ge 4	Sta	ge 5	Star	ge 6
Stages		ing IP		tem on		ge 3 C		ing &		sage	1	ling IC
		igns		p (SoC)	_	ation &		aging		Juge	, necyc	
				gration		mbly		66				
Stage Attack						es						
Possible?												
Defences		unterfe	_		nation Le	•		Sabotage			amperin	_
ID No		efence			<mark>efence II</mark>			efence II			efence I	
Stage 1	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
Stage 2	7 1	8 2	9	16 10	17 11	18 12	19	20	21	23	24	25
Stage 2	_	5	6					20	21			25
	4			13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 3	1	2	3	10	11	12	19	20	21	23	24	25
	7	5 8	6	13	14 17	15 18	22			26	27	
Stage 4	1	2	9	16 10	11	12	19	20	21	23	24	25
Stage 4	4	5	6	13	14	15	22	20	21	26	27	23
	7	8	9	16	17	18	22			20	27	
Stage 5	1	2	3	10	11	12	19	20	21	23	24	25
2 22 2	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 6	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Help						Descri	ption					
	Root of		-				_					
	•	-	_	mpanies c			ning and	ı acquiri	ng expe	nsive foi	undries;	nence,
Defence ID		outsou	rcing the	ir fabricat	ion proc	ess Defe	nco					
(Card)						Dele	lice					
10 (5)	IP Pirac	v: Preve	ntion M	ethod: Spl	it Manuf	acturing	<u> </u>					
		,		Jai Jpi			<b>.</b>					

Attack ID No	Sequenc	<b>a</b>   <b>a</b>				Desc	ription	of Attac	k			
26	24		malicio	us foundr	v can rei					erbuild t	he ICs b	ecause
				arency of		•	_					
				on of the o		_						
								·				
CICT Catagomi	Count	erfeitin	ng	Informa	tion Lea	kage	Si	abotage		Ta	amperin	g
CIST Category	Т	rue			False			False			False	
Attacker	Class 1 -	Advers	ary	Class 2	- Advers	ary	Class 3	3 - Adver	sary	Class	4 - Adve	rsary
	A small				academic			organise			tate-fund	
		hacke			rch grou	-		ninal gan	_		ganisatio	
	1 1000	k Level age 1-2			ack Level wage 1-3			tack Leve 1 wage 1-			ttack Lev n wage 1	_
Highest Level		age 1-2 2		Call	3	<u> </u>	Cai	3	3	Ca	11 wage 1	-4
Min Attack		3										
Level		J	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0									
Stages	Stage	1	St	age 2	Sta	ge 3	Sta	ge 4	Sta	ge 5	Sta	ge 6
<b>3</b> 3 3	Sourcin			tem on		C		ing &		sage	,	ling IC
	Desig	_	1	p (SoC)	Fabrica	ation &		aging		Ŭ	,	J
			Inte	gration	Asse	mbly						
Stage Attack					Υ	es						
Possible?												
Defences		terfeiti	•		nation L	_		Sabotag			amperir	_
ID No		ence ID			efence I			efence I	1		efence I	1
Stage 1	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
<u> </u>	7	8	9	16	17	18	10	20	24	22	2.4	25
Stage 2	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 3	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 4	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 5	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22	-		26	27	<del>                                     </del>
Store C	7	2	9	16	17	18	10	30	21	22	24	25
Stage 6	4	5	3 6	10	11 14	12 15	19 22	20	21	23 26	24 27	25
	7	8	9	13 16	17	18				20	21	
Help	,	0		10		Descrip	ntion					
Help	Root of vu	Inerah	ility			Descrip	761011					
				the serial	numher	s and did	rital ider	ntificatio	n numb	ers to cla	ning	
Defence ID	V(			the serial	a.iibci	Defer		············		2.3 00 010	J.11118	
(Card)						20.01						
7 (J)	Preventio	n Meth	od: Act	ive IC Me	tering: A	ctive me	etering, f	orce ne	w IC pro	cess to b	e activa	ted
ν- /												

Attack ID No	Sequence Description of Attack												
21	25			er uses m			_						
			_	a chip, wh			_	nternal si	ignals ai	nd revea	ling sens	itive	
				are not m									
CIST Category	Cou	nterfeiti	ng	Information Leakage			Sabotage			Tampering			
	=•	False			False			False		False			
Attacker		1 - Advers	- 1		- Advers	- 1		3 - Advers	-	Class 4 - Adversary A state-funded Organisation			
		nall group ous hacke			rch grou			organise ninal gan					
		tack Level	_		ack Level	- 1		tack Leve	_		tack Lev		
	car	n wage 1-2	2	can	wage 1-3	}	car	wage 1-	3	can wage 1-4			
Highest Level		2			3			3			4		
Min Attack		3											
Level		<u>-</u>					T					_	
Stages		ge 1		age 2		ge 3		ge 4		ge 5		ge 6	
		cing IP signs	-	tem on p (SoC)	_	C ation &		ing & aging	IC U	sage	Recycling IC		
	Des	oigiis		gration		mbly	Pack	agilig					
Stage Attack			11100	gration	ASSC				Tı	ue			
Possible?													
Defences	Co	unterfeit	ing	Inform	nation Le	eakage	!	Sabotage	e	Tampering			
ID No	D	efence II		De	efence II	Ds	D	efence II	Ds	D	Defence IDs		
Stage 1	1	2	3	10	11	12	19	20	21	23	24	25	
	4	5	6	13	14	15	22			26	27		
	7	8	9	16	17	18							
Stage 2	1	2	3	10	11	12	19	20	21	23	24	25	
	4	5	6	13	14	15	22			26	27		
	7	8	9	16	17	18							
Stage 3	1	2	3	10	11	12	19	20	21	23	24	25	
	4	5	6	13	14	15	22			26	27		
	7	8	9	16	17	18							
Stage 4	1	2	3	10	11	12	19	20	21	23	24	25	
	4	5	6	13	14	15	22			26	27		
Chara E	7	8	9	16	17	18	10	20	24	22	24	25	
Stage 5	4	5	3 6	10	11 14	12 15	19 22	20	21	23 26	24 27	25	
	7	8	9	16	17	18				20	21		
Stage 6	1	2	3	10	11	12	19	20	21	23	24	25	
2.000	4	5	6	13	14	15	22			26	27		
	7	8	9	16	17	18							
Help						Descri	ption						
	Root of	vulnerab	ility										
	•	The tran	smissio	n of sensit	ive info	rmation	on the i	nternal v	vires wi	thout suf	fficient		
		protection	on										
Defence ID (Card)						Defe	nce						
14 (9)		y: Detect	ion Me	thod: Wat	ermarkii	ng - Digi	tal Wate	rmarking	g to hide	e informa	ation in t	the	
	signal												

Attack ID No	Sequence Description of Attack												
18	26			attacker is to be able to inject an intentional fault, using a series of technique anipulate the environmental conditions of a circuit, that results in the desired									
			•		environn	nental c	ondition	s of a cir	cuit, tha	at results	in the c	lesired	
	_		ault effe			- 1							
CIST Category	Cou	nterfeit	ing	Information Leakage			Si	abotage		Tampering			
	Cl 4	False			False		Cl	False		True Class 4 - Adversary			
Attacker		l - Adver all group	- 1		- Advers academic	- 1		3 - Advers organise	-			-	
		ous hack			arch grou			ninal gan		A state-funded Organisation			
	Att	tack Leve	el		ack Level	-		tack Leve	_		ttack Lev		
	can	wage 1	-2	can	wage 1-3	3	car	wage 1-	3	ca	n wage 1	4	
Highest Level		2			3			3			4		
Min Attack		3											
Level	Sta	go 1	C.	age 2	Sta	ge 3	C+a	ge 4	Sto	ge 5	Sto	ge 6	
Stages		ing IP		tem on		ge 3 C		ge 4 ing &		lsage		_	
		igns		p (SoC)		ation &		aging		Juge	Recycling IC		
				gration	Asse	mbly							
Stage Attack									Υ	es			
Possible?													
Defences		unterfei	•		nation Le	_		Sabotage		Tampering			
ID No		efence I			efence II			efence II			efence I		
Stage 1	4	2 5	3 6	10	11 14	12 15	19 22	20	21	23	24 27	25	
	7	<u></u>	9	16	17	18	22			20	27		
Stage 2	1	2	3	10	11	12	19	20	21	23	24	25	
01480 =	4		6	13	14	15	22			26	27		
	7	8	9	16	17	18				1 20			
Stage 3	1	2	3	10	11	12	19	20	21	23	24	25	
Juage 3	4	5	6	13	14	15	22	20	21	26	27	25	
	7	8	9	16	17	18				20			
Stage 4	1	2	3	10	11	12	19	20	21	23	24	25	
	4	5	6	13	14	15	22			26	27		
	7	8	9	16	17	18							
Stage 5	1	2	3	10	11	12	19	20	21	23	24	25	
	4	5	6	13	14	15	22			26	27	28	
-	7	8	9	16	17	18	1.5						
Stage 6	1	2	3	10	11	12	19	20	21	23	24	25	
	7	5	6	13	14	15	22			26	27		
Help	/	8	9	16	17	18 Descri	ntion						
пеір	Root of	vulnera	hility			וואפארוו	puon						
			•	the comp	utation a	igainst a	lmost all	l known	ciphers				
Defence ID (Card)		.,55c a				Defe							
28 (8)	IP encry	pted so	that eve	n if the IC	is physi	cally att	acked, it	s IP cann	ot be d	eciphere	d		
				_	_		_			_			

Attack ID No	Sequence Description of Attack  27 Reverse engineering attack – by using De-capsulation that is the removal of the												
10	27	Re	everse	<mark>engineeri</mark> n	ig attack	– by usi	ng De-ca	psulation	n that i	s the ren	noval of	the	
				ckaging ar	•	_				•			
				reverse o								be	
		us	sed to r	e-construc	ct the ne	tlist and	ultimate	ely expo	se desig	n secret	S		
CIST Category	Coun	terfeitir	ng	Informa	tion Lea	kage	Sa	botage		Tampering			
CIST Category		False			True			False		False			
Attacker		- Advers	-		- Advers	- 1		3 - Adver	-	Class 4 - Adversary			
		all group us hacke			academic arch grou			organise ninal gan		A state-funded Organisation			
		ack Level			ack Level	-		ack Leve	_		ttack Lev		
	can	wage 1-2	2	can	wage 1-3	}	can	wage 1-	3	ca	n wage 1	-4	
Highest Level		2			3			3			4		
Min Attack		3											
Level	6												
Stages	Stag			tage 2		ge 3	1	ge 4		ge 5		ge 6	
	Sourci Desi	_	•	stem on ip (SoC)	-	C ation &		ng & aging	IC Usage		Recycling IC		
	Desi	Биз		egration		mbly	Fack	agilig					
Stage Attack				<u> </u>		es							
Possible?													
Defences		nterfeit	_		nation Le	•		Sabotag			amperir	_	
ID No	Defence IDs			Defence IDs		Defence IDs					Ds		
Stage 1	1	2	3	10	11	12	19	20	21	23	24	25	
	7	5 8	6 9	13	14 17	15 18	22			26	27		
Stage 2	1	2	3	16 10	11	12	19	20	21	23	24	25	
Stage 2	4	5	6	13	14	15	22	20	21	26	27	25	
	7	8	9		17		22			20	27		
Chara 2				16		18	10	20	24	22	24	25	
Stage 3	4	<u>2</u> 5	<u>3</u>	10	11 14	12 15	19 22	20	21	23 26	24 27	25	
	7	8	9	16	17	18	22			20	21		
Stage 4	1	2	3	10	11	12	19	20	21	23	24	25	
otuge .	4	5	6	13	14	15	22			26	27		
	7	8	9	16	17	18							
Stage 5	1	2	3	10	11	12	19	20	21	23	24	25	
	4	5	6	13	14	15	22			26	27		
	7	8	9	16	17	18							
Stage 6	1	2	3	10	11	12	19	20	21	23	24	25	
	4	5	6	13	14	15	22			26	27		
Halm	7	8	9	16	17	18	ation						
Help	Root of v	Julnarah	ility			Descri	JUUN						
			•	ween circu	ıit lavout	t and the	gate-le	vel netli	st and 11	ltimately	the des	ign	
		function					- Parc Ic		et ana a	······	, the des	.0	
Defence ID			-1			Defe	nce						
(Card)													
11 (6)	IP Piracy	: Preven	tion M	ethod: Hai	rdware C	)bfuscat	ion - IC C	Camoufla	aging				
12 (7)				ethod: Hai							g		
13 (8)	IP Piracy	: Preven	tion M	ethod: Hai	rdware C	Obfuscat	ion - Seq	uential	Logic Lo	cking			

Attack ID No	Sequence Description of Attack											
15	28	A	<mark>An attacl</mark>	cer has acc	ess to a	fabricat	ted chips	and IC r	<mark>emarki</mark> r	ng tool to	remark	( ICs
CIST Category	Cou	nterfeit	ing	Information Leakage			S	abotage		Tampering		
cio i categoi y		True		False			False			False		
Attacker		1 - Advei	- 1		- Advers	-		3 - Advers	-	Class 4 - Adversary		
		all group	- 1		academic			organise		A state-funded		
		tack Leve			rch grou ack Level	- 1		ninal gan tack Leve	_	Organisation Attack Level		
		wage 1			wage 1-3			wage 1-		can wage 1-4		
Highest Level		2			3			3			4	
Min Attack		2										
Level												
Stages	Sta	ge 1	St	tage 2	Sta	ge 3	Sta	ge 4	Sta	ge 5	Sta	ge 6
		ing IP		tem on		С		ing &	IC U	Isage	Recyc	ling IC
	Des	igns		p (SoC)		ation &	Pack	aging				
			Inte	gration		mbly						
Stage Attack					Y	es	Y	es	Υ	es	Υ	es
Possible?  Defences	Cou	unterfei	iting	Inform	nation Le	nakaga		Sabotage			amporis	200
ID No		efence	_		efence II	•		efence II		Tampering Defence IDs		
Stage 1	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 2	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 3	1	2	3	10	11	12	19	20	21	23	24	25
Stage 3	4	5	6	13	14	15	22	20	21	26	27	25
	7	8	9	16	17	18				20		
Stage 4	1	2	3	10	11	12	19	20	21	23	24	25
J	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 5	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 6	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Help						Descri	ption					
	Root of		•		1.10							
				o fabricate		_:						
			-	emarking t		_	ICc					
				nands for				to proto	ct IDc			
			_	ons or law ulty associa				-				
Defence ID		recitific	Lai ulliici	arry assuch	ateu Will	Defe		oneu cili	μs			
(Card)						Dele	iicc					
3 (7)	Detection	on Meth	nod: Fine	erprinting	Conven	tional se	erial num	bers				
4 (8)				erprinting								
6 (10)				erprinting			rinting					
- ()	2130011			, I	8.00	05.6	, <u>o</u>					

Attack ID No	Sequence Description of Attack											
8	29		IP theft a	ittack by a	malicio	us engin	eer in th	e SoC de	esign ho	use, who	has acc	ess
			to third p	oarty IPs, o	an steal	design	secrets					
CIST Category	Cou	nterfei	ting	Information Leakage			S	abotage		Tampering		
Attacker	Class	False  1 - Adv	- M-C- M-1	True Class 2 - Adversary			Class	False  3 - Adver	50 W.	False Class 4 - Adversary		
Attacker		all grou	-		academic	-		organise	-		tate-fund	-
		ous hac	-		arch grou			ninal gan		Organisation Attack Level		
	At	tack Le	vel	Att	ack Level		At	tack Leve	ı			
	car	n wage	1-2	can	wage 1-3	1	car	wage 1-	3	ca	n wage 1	-4
Highest Level		2			3			3			4	
Min Attack		2										
Level Stages	Sta	ge 1	S.	tage 2	Sta	ge 3	Sta	ge 4	Sta	ge 5	Sta	ge 6
Stages		cing IP		tem on		c C		ing &		sage		_
		signs		p (SoC)	Fabrica	ation &		aging	ie osage		Recycling IC	
				gration		mbly						
Stage Attack	Y	es		Yes								
Possible?												
Defences		unterf	_		nation Le	•		Sabotag		Tampering		
ID No		efence			efence I			efence I	1		efence I	
Stage 1	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
Chara 2	7	8 2	9	16	17	18	10	20	21	22	24	25
Stage 2	1		_	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 3	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
Store 4	7	2	9	16 10	17 11	18 12	19	20	21	23	24	25
Stage 4	4	5	6	13	14	15	22	20	21	26	27	23
	7	8	9	16	17	18				20	27	
Stage 5	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Stage 6	1	2	3	10	11	12	19	20	21	23	24	25
	4	5	6	13	14	15	22			26	27	
	7	8	9	16	17	18						
Help						Descri	ption					
	Root of				_		. 6:1				_	
	•	_		having ac		ne Iayo	ut files o	the des	sign, ma	King it ea	asy to re	cover
Defence ID		tne IP	by rogue	employee	!\$	Defe	nce					
(Card)						Dele	iice					
10 (5)	IP Pirac	v: Prev	ention M	ethod: Spl	it Manuf	acturin	g					
10 (0)		,		Jul Jpi			5					

Attack ID No	Sequei	nce				Des	cription	of Attac	k				
6	30		_	g defective chips Defective ICs are chips that have failed the functional or netric tests or found to be out of spec, and subsequently placed in the									
		pa	<mark>arametr</mark>	ic tests or	found t	o be ou	t of spec	, and sub	sequen <sup>.</sup>	tly place	d in the		
		m	arket a	s authenti	c produc	cts							
CIST Category	Cou	nterfeitir	ng	Informa	tion Lea	kage	S	abotage		Tampering			
cior category		True			False			False			False		
Attacker		1 - Advers	-		- Advers	- 1		3 - Adver	-		4 - Adve	•	
		all group			academic			organise			tate-fund		
		ous hacke			arch grou	- 1		minal gan	_		rganisatio		
		tack Level wage 1-2			ack Level wage 1-3			tack Leve 1 wage 1-			ttack Lev n wage 1		
Highest Level	Can	2	-	Call	3	'	Cai	3	3	Ca	11 wage 1		
Min Attack		1											
Level		1											
Stages	Sta	ge 1	S+	age 2	Sta	ge 3	Sta	ge 4	Sta	ge 5	Sta	ge 6	
Juges		ing IP		tem on		EC 3		ing &		sage		ling IC	
		igns	-	o (SoC)	_	ation &		aging	ic Osage		Recycling ic		
		18.13		gration		mbly	Tuck	~B…B					
Stage Attack			11100	B. a. a. a.	71000		Y	es					
Possible?													
Defences	Cou	unterfeit	ing	Inform	nation Le	eakage	9	Sabotag	e	Т	amperir	ng	
ID No		efence II	•	Defence IDs			Defence IDs			Defence IDs			
Stage 1	1	2	3	10	11	12	19	20	21	23	24	25	
	4	5	6	13	14	15	22			26	27		
•	7	8	9	16	17	18							
Stage 2	1	2	3	10	11	12	19	20	21	23	24	25	
	4	5	6	13	14	15	22			26	27		
	7	8	9	16	17	18							
C+ 2							10	20	21	22	24	25	
Stage 3	1	2	3	10	11	12	19	20	21	23	24	25	
	7	5	6	13	14	15	22			26	27		
Clara A	-	8	9	16	17	18	10	20	24	22	2.4	25	
Stage 4	1	2	3	10	11	12	19	20	21	23	24	25	
	4	5	6	13	14	15	22	-		26	27	1	
Charles E	7	8	9	16	17	18	10	20	24	22	24	25	
Stage 5	1	2	3	10	11	12	19	20	21	23	24	25	
	4	5	6	13	14	15	22	-		26	27	-	
Ct	7	8	9	16	17	18	10	20	24	22	2.4	25	
Stage 6	1	2	3	10	11	12	19	20	21	23	24	25	
	4	5	6	13	14	15	22	-		26	27		
	7	8	9	16	17	18							
Help	D 1	1	.1			Descri	ption						
		vulnerab	•	. 16 1 1									
2.6	•	Ease of a	ccess to	o IC black	markets								
Defence ID						Defe	nce						
(Card)							<u> </u>	<u> </u>					
9 (K)	Prevent	ion Meth	iod: Sup	ply Chain	Compro	mise IC	Supply (	nain As	surance				