

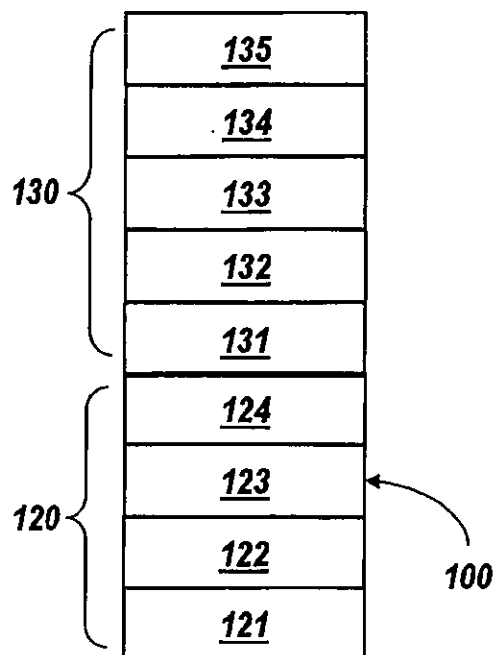


Fig. 1

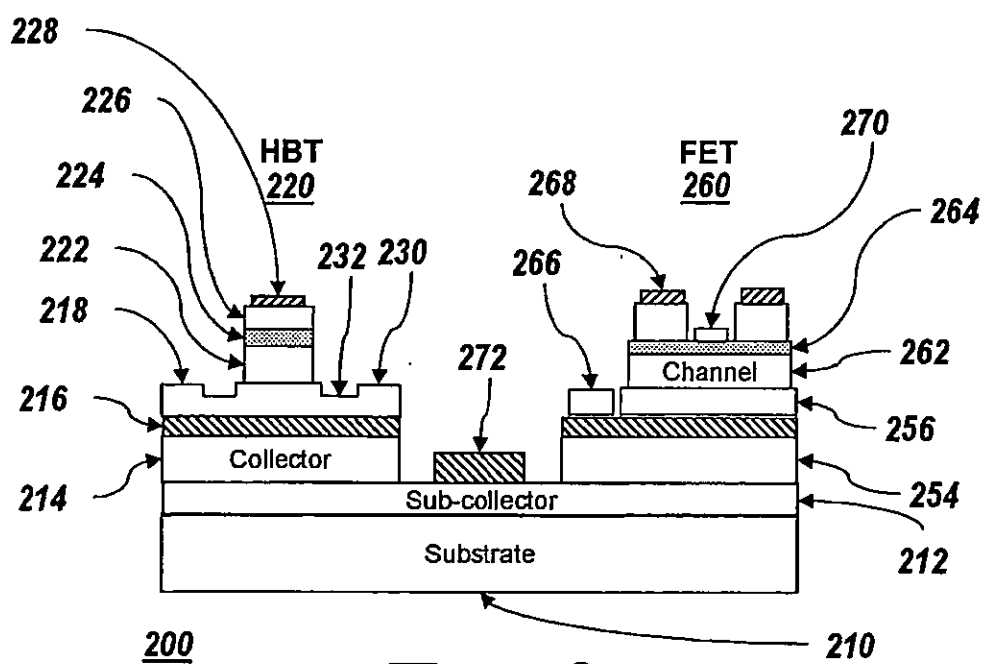
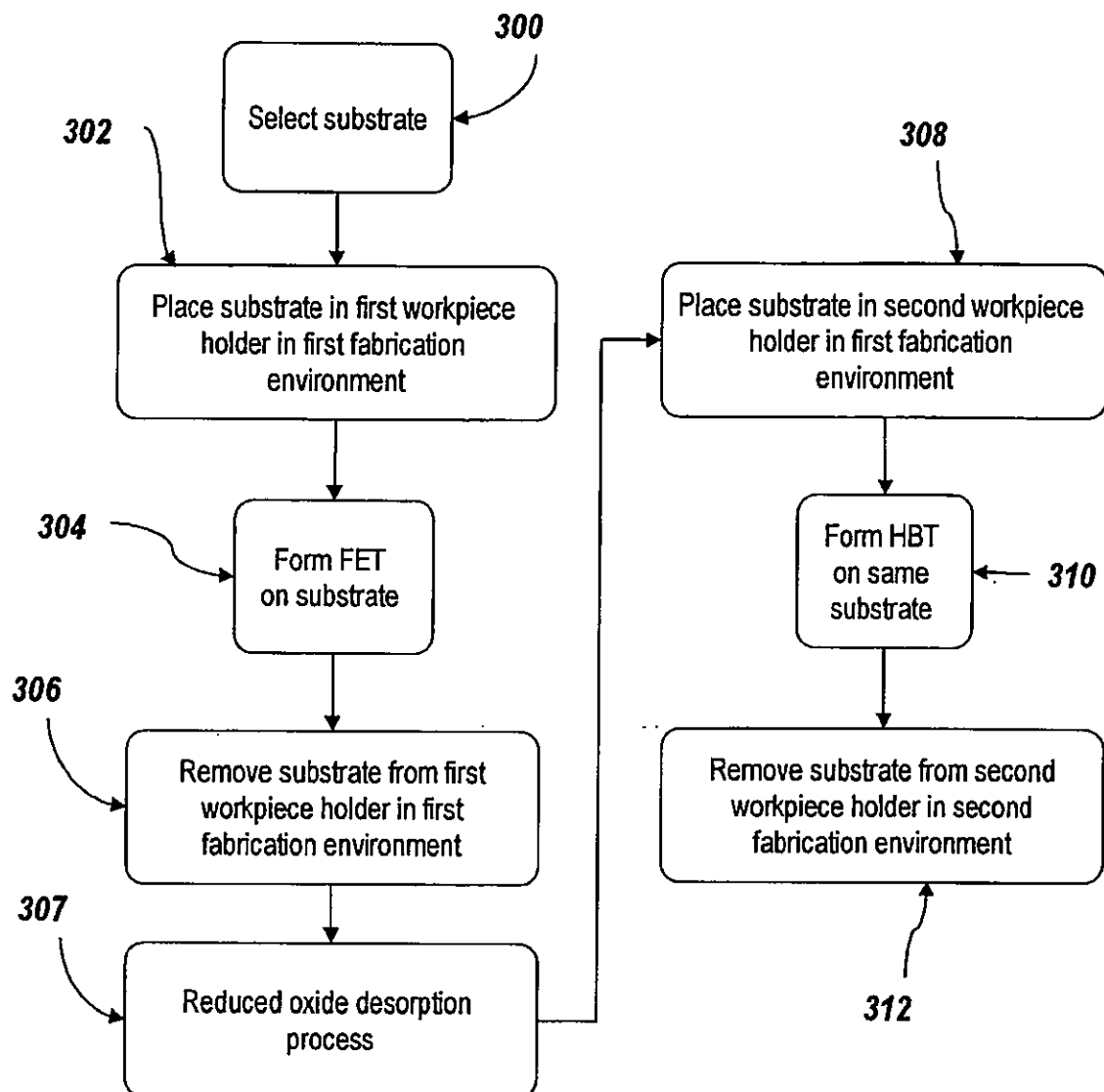


Fig. 2

*Fig. 3*

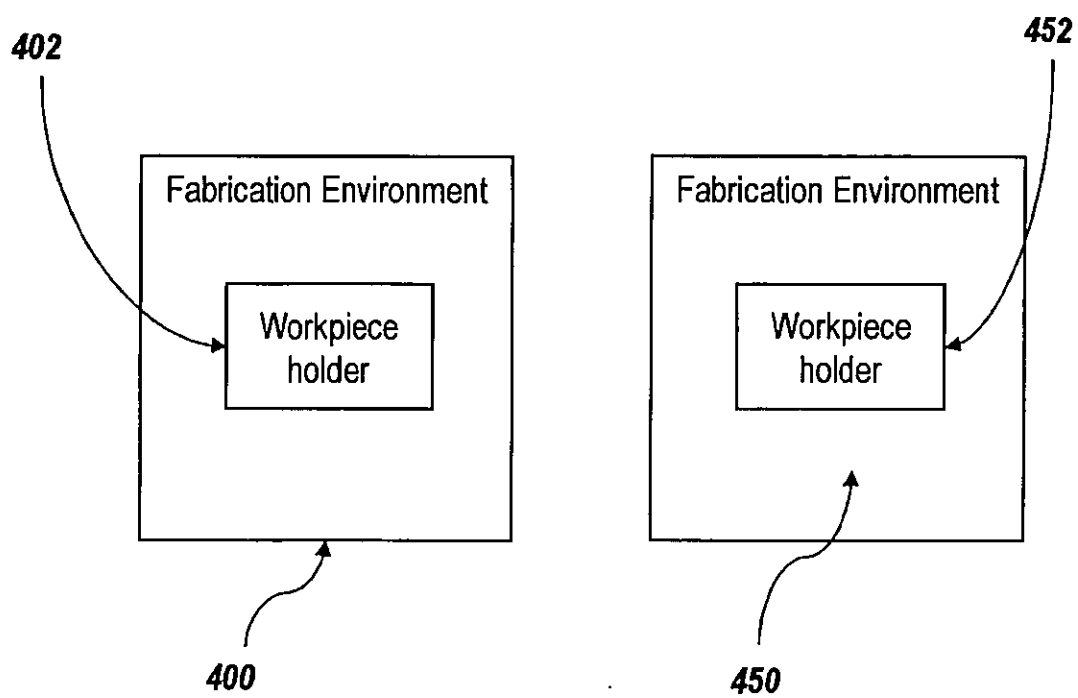


Fig. 4

		Material	Composi-tion	Dopant	Type	Concen-tration (cm ⁻³)	Thick-ness (Å)	Layer Descrip-tion	
532	544	523	InGaAs	>50%	Te	n	>1x10 ¹⁹	500	Contact
		522	InGaAs	Grade	Te	n	>1x10 ¹⁹	500	Contact
		521	GaAs		Si	n	4.00x10 ¹⁸	1000	Contact
	520	InGaP	50	Si	n	3.00x10 ¹⁷	400	Emitter	
	519	GaAs		C	P	4.00x10 ¹⁹	1000	Base	
	542	518	GaAs		Si	n	1.00x10 ¹⁶	5000	Collector
		517	GaAs		Si	n	5.00x10 ¹⁶	4000	Collector
		516	GaAs		Si	n	3.00x10 ¹⁸	6000	SubCollect or
	515	InGaP	50%	Si	n	1.00x10 ¹⁸	150		
	514	GaAs		Si	n	3.00x10 ¹⁸	100		
	530	513	n-GaAs		Si	n	2.00x10 ¹⁸	500	Contact
		512	n		Si	n	3.00x10 ¹⁷	200	Contact
		511	AlAs	x=1.00	-	-		20	Etch Stop
		510	Al _x Ga _{1-x} As	x=0.24	-	-		200	Schottky Layer
		509	Al _x Ga _{1-x} As	x=0.24	Si	n	2.00x10 ¹⁸	120	Donor
		508	Al _x Ga _{1-x} As	x=0.24	-	-		20	Spacer
		507	In _x Ga _{1-x} As	x=0.16	-	-		120	Channel
		506	Al _x Ga _{1-x} As	x=0.24	-	-		200	Spacer
		505	Al _x Ga _{1-x} As	x=0.24	Si	n	2.00x10 ¹⁸	60	Donor
504		Al _x Ga _{1-x} As	x=0.24	-	-		200	Transition	
540		503	10x Al _x Ga _{1-x} As	x=0.24	-	-		200	Super-lattice Buffer
		502	GaAs		-	-		15	
		501	GaAs		-	-		200	Substrate

Fig. 5

	R (mm)=	0	22	41	43	Average
Gain	1KA/sq	104.48	103.25	102.16	101.78	102.92
Base Sheet (ohms/sq)		229.83	225.46	221.21	223.6	225.03
Collector Sheet (ohms/sq)		12.79	12.75	12.67	12.59	12.7
Emitter Sheet (ohms/sq)		26.83	27.54	29.17	29.68	28.3
Base collector breakdown (V)		26.45	26.49	26.51	26.47	26.48
Base emitter breakdown (V)		6.47	6.47	6.47	6.41	6.45
Collector emitter breakdown (V)		13.22	13.23	13.27	13.01	13.18

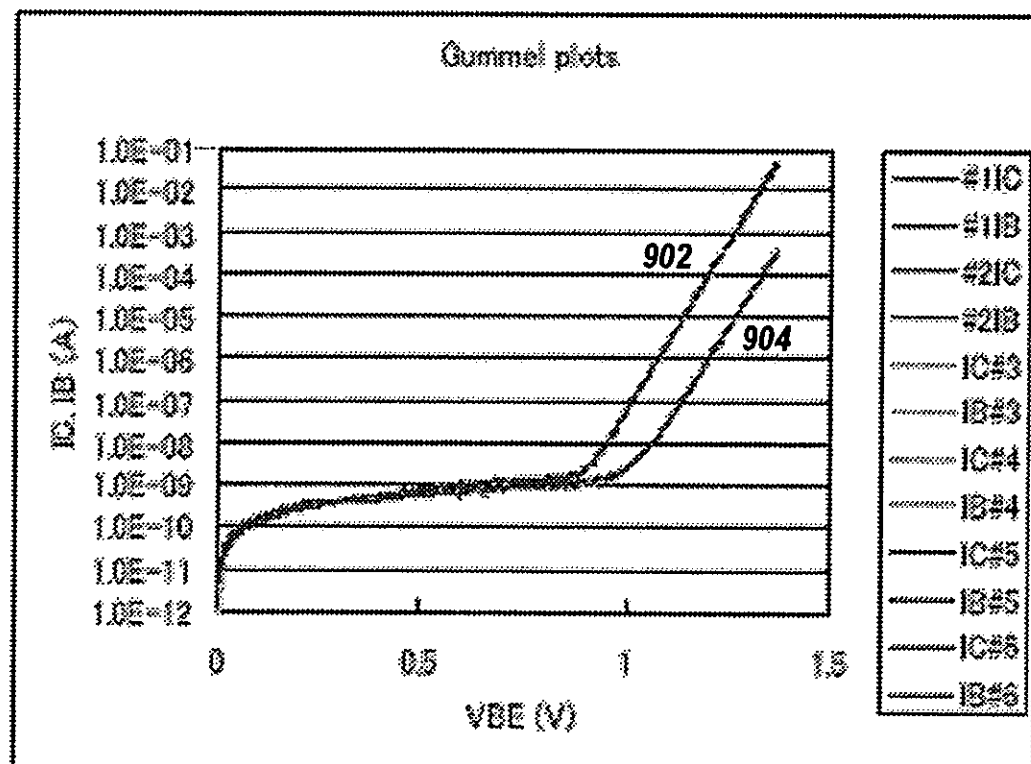
Fig. 6

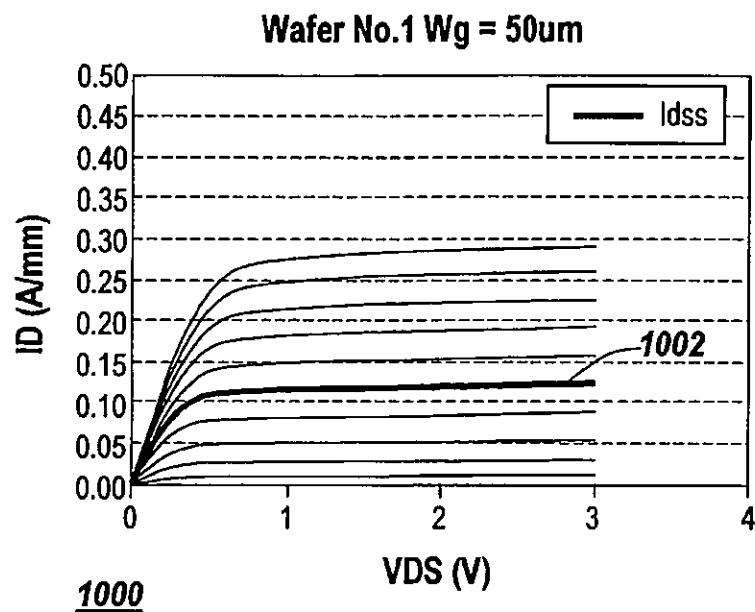
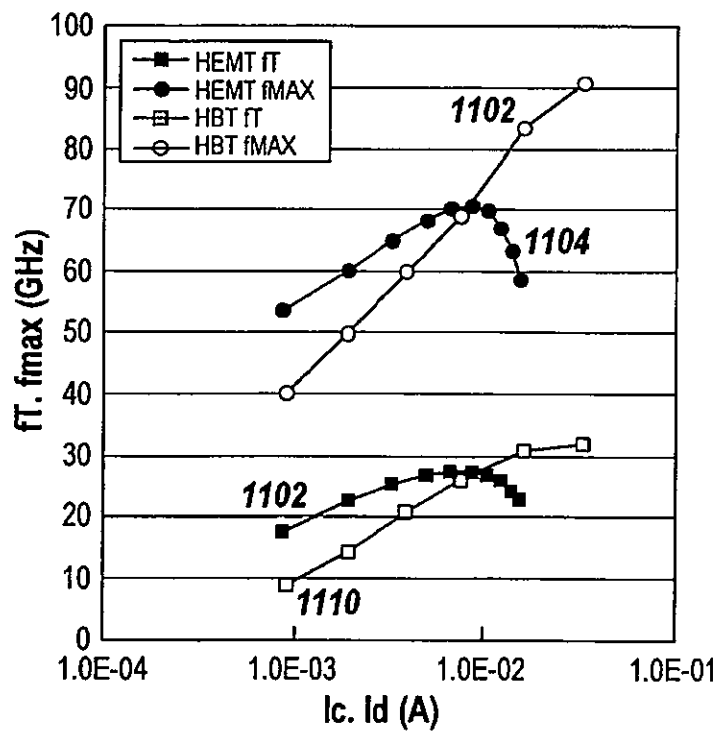
		Material	Composi- tion	Dopant	Type	Concen- tration (cm ⁻³)	Thick- ness (Å)	Layer Descrip- tion
750	736	In _x Ga _{1-x} As		Te		>10 ¹⁹	1000	Contact
	734	GaAs		Si		>10 ¹⁹	500	Contact
	732	InGaP		Si		3x10 ¹⁷	500	Emitter
	730	GaAs				4x10 ¹⁹	800	Base
	740	728	GaAs			5x10 ¹⁵	4000	Collector Region
		727	GaAs			1x10 ¹⁶	4000	Collector Region
	726	GaAs		Si		4x10 ¹⁸	5000	Sub- collector
	724	InGaP		Si		4x10 ¹⁸	200	Etch Stop
	722	GaAs		Si		3x10 ¹⁷	500	Cap
	720	GaAs					200	Contact
760	718	Al _x Ga _{1-x} As	x=0.24	Si		2.00x10 ¹⁸	200	Schottky Layer
	716	Al _x Ga _{1-x} As	x=0.24				120	Donor
	714	Al _x Ga _{1-x} As	x=0.24				20	Spacer
	712	In _x Ga _{1-x} As	x=0.15				120	Channel
	710	Al _x Ga _{1-x} As	x=0.24				20	Spacer
	708	Al _x Ga _{1-x} As	x=0.24	Si		2x10 ¹⁸	60	Donor
	706	Al _x Ga _{1-x} As	x=0.24				200	Transitio n
	704	GaAs					2000	Buffer
	702	GaAs						Substrat e

700

Fig. 7

	300K		77K	
Material	Hall Mobility (cm ² /V-s)	Hall Sheet Resistance (cm ⁻²)	Hall Mobility (cm ² /V-s)	Hall Sheet Resistance (cm ⁻²)
PHEMT (Original)	5.87E+03	-2.12E+12	1.53E+04	-3.00E+12
BiFET, regular growth	4.69E+03	-2.08E+12	9.55E+03	-3.35E+12
BiFET, reduced temperature	5.61E+03	-2.44E+12	1.40E+04	-3.42E+12

Fig. 8900*Fig. 9*

*Fig. 10**Fig. 11*