

# Process Introduction

## 2um / 36V Bipolar Process Technology

### Process features

- Up-down isolation
- Deep N+ collector plug
- N-channel stop
- NPN transistor
- Lateral PNP transistor
- Implant resistor (optional)
- MOS capacitor
- Double metal (optional)
- Applications: Analog, Power Linear

### Key Design Rules

	10 Masks	Min. Width/Space(um)
Diffusion		4
Contact		2
Metal		3/2

### Electrical Specification

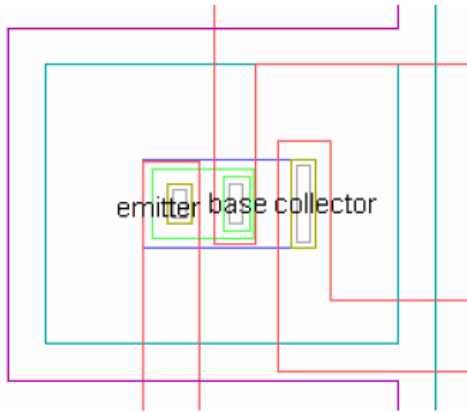
Device	Parameter	Specification			
		Min	Typ	Max	Unit
NPN (LV) (5x7 um <sup>2</sup> emitter)	Hfe(Ic=100uA)	80	140	250	-
	BVceo(Ic=10uA)	18	-	-	V
	BVebo(I=10uA) (without XBASE)	7.2	7.5	7.8	V
	BVebo(I=10uA)(with XBASE)	6.8	7.3	7.8	V
NPN (HV) (5x7 um <sup>2</sup> emitter)	Hfe(Ic=100uA)	80	140	250	-
	BVceo(Ic=10uA)	36	44	-	V
PBASE-LPNP(LV) (Wb=12um without emitter guarding)	Hfe(Ic=10uA)	100	350	600	-
	BVceo(Ic=10uA)	18	-	-	V
PBASE-LPNP(HV) (Wb=12um with emitter guarding)	Hfe(Ic=10uA)	100	350	600	-
	BVceo(Ic=10uA)	36	50	-	V
XBASE-LPNP(LV) (Wb=14um without emitter guarding)	Hfe(Ic=10uA)	150	500	900	-
	BVceo(Ic=10uA)	18	-	-	V
XBASE-LPNP(HV) (Wb=16um with emitter guarding)	Hfe(Ic=10uA)	150	500	900	-
	BVceo(Ic=10uA)	36	54	-	V
Sheet Resistance(20x200um <sup>2</sup> )	PBASE-R	190	215	240	Ω/□
	Implant-R	18.4	2.3	27.6	kΩ/□
Capacitance (Si <sub>3</sub> N <sub>4</sub> )	C(100x100um <sup>2</sup> )	7.9	9.3	10.7	pF

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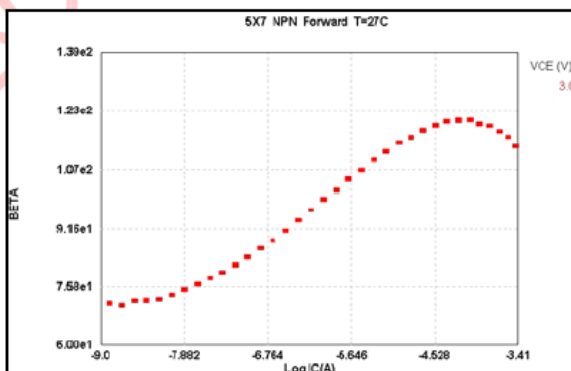
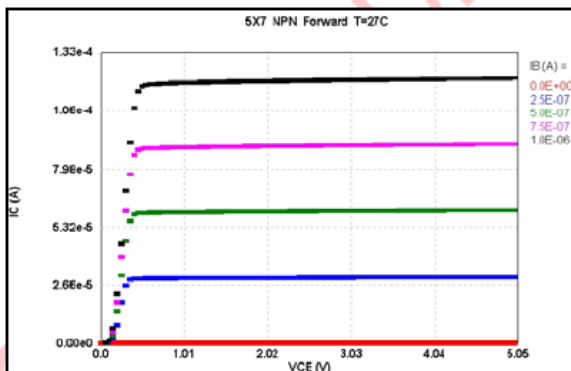
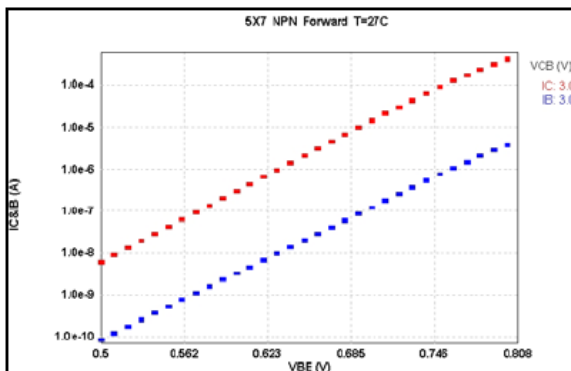
## Device characteristic curve

### NPN 5×7 without DN(LV)

#### Layout

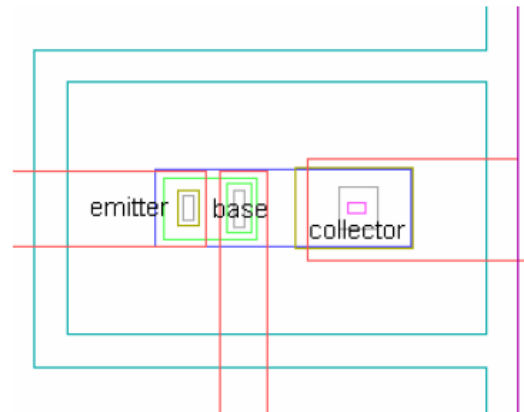


#### I-V curve

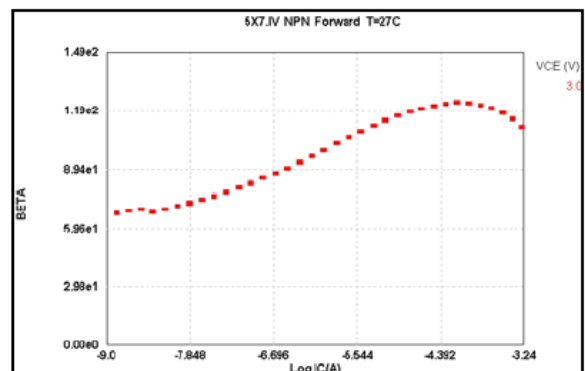
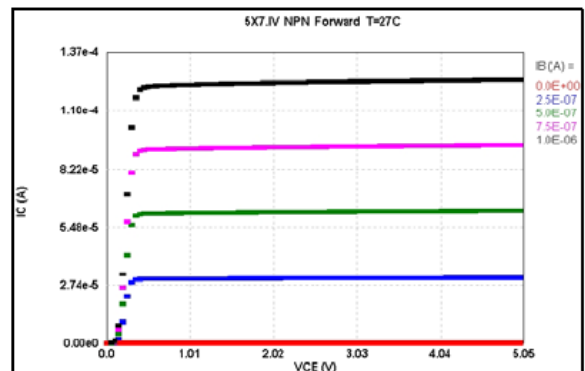
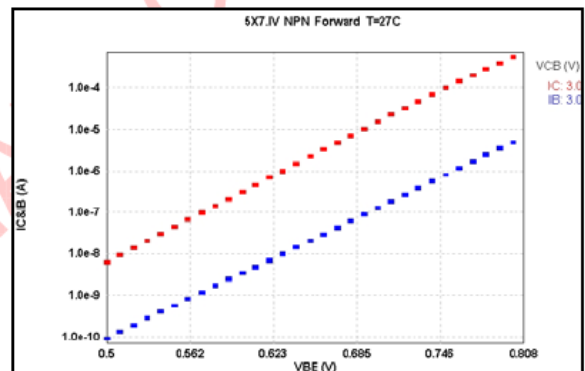


### NPN 5×7 with DN (LV)

#### Layout



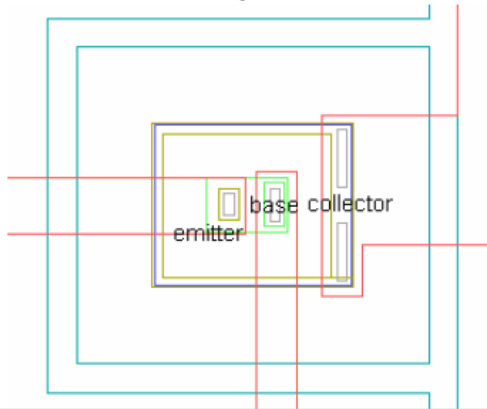
#### I-V curve



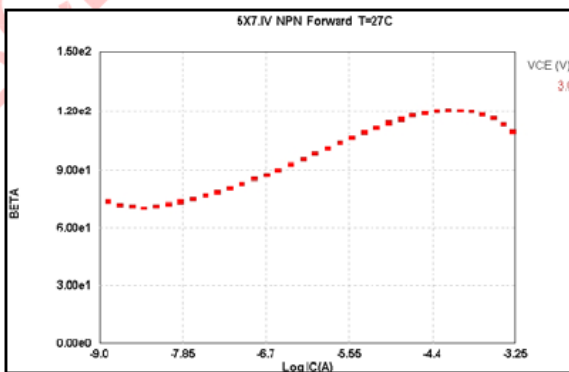
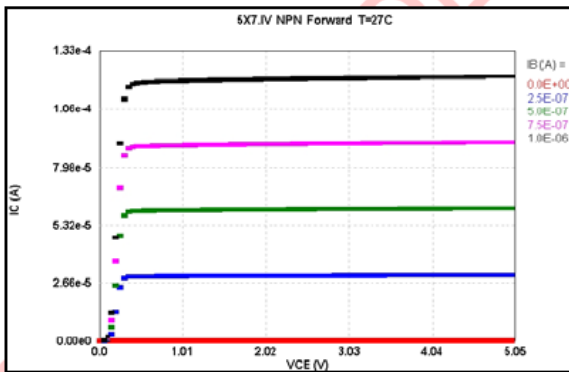
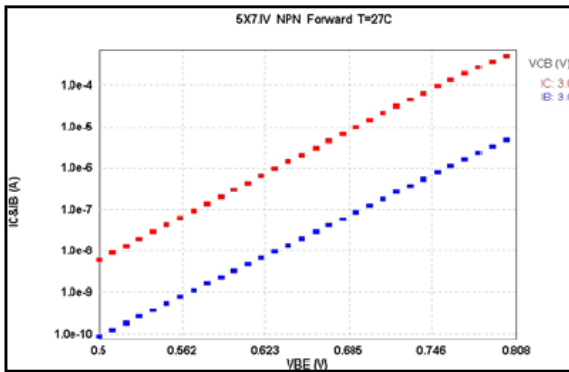
# Process Introduction

## NPN 5x7 without DN(HV)

### Layout

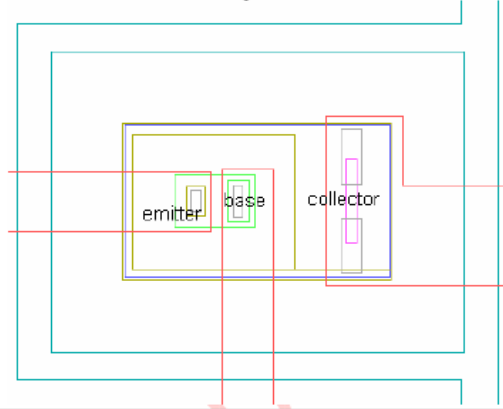


### I-V curve

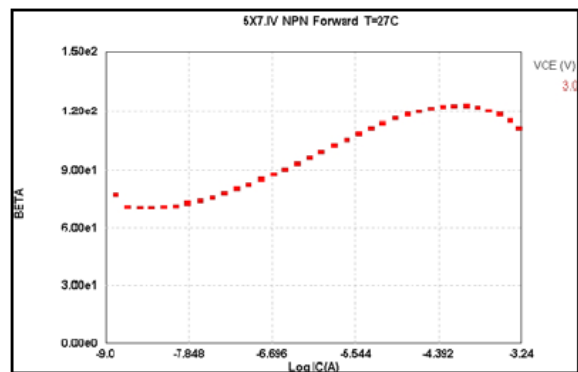
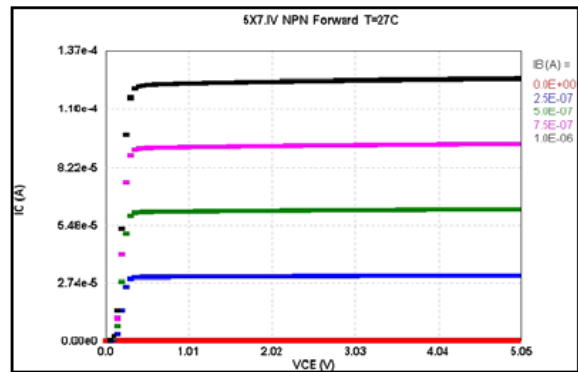
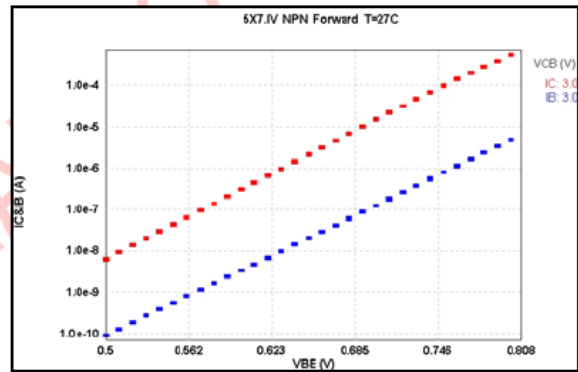


## NPN 5x7 with DN (HV)

### Layout



### I-V curve

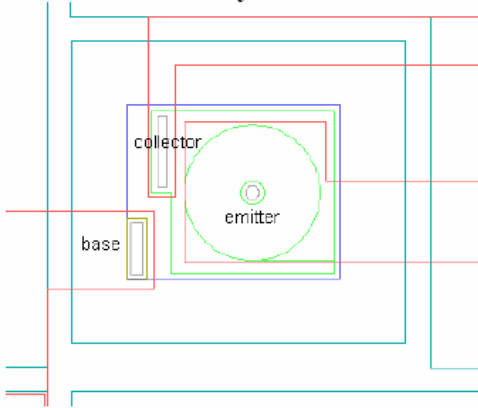


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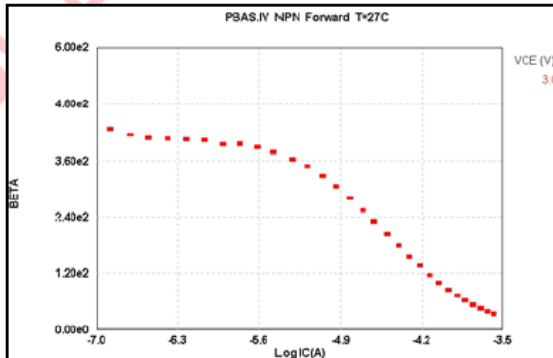
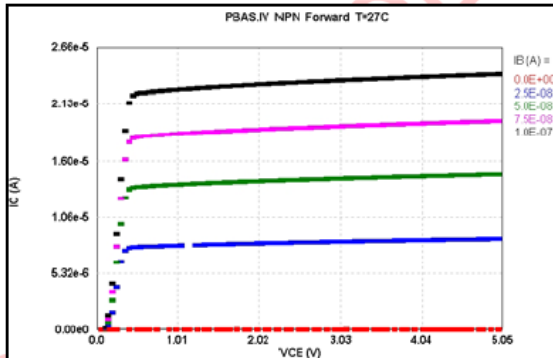
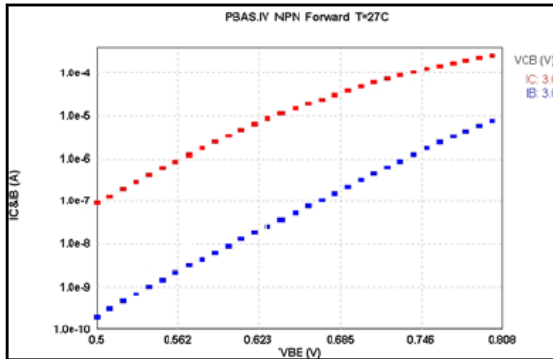
## PBAS LPNP without guarding

$\phi=7.0\ \mu\text{m}$ ,  $W_b=12.0\ \mu\text{m}$

### Layout



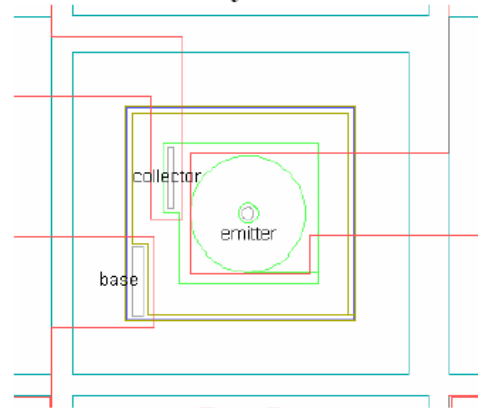
### I-V curve



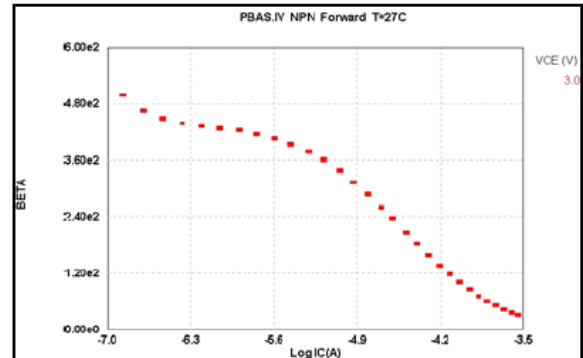
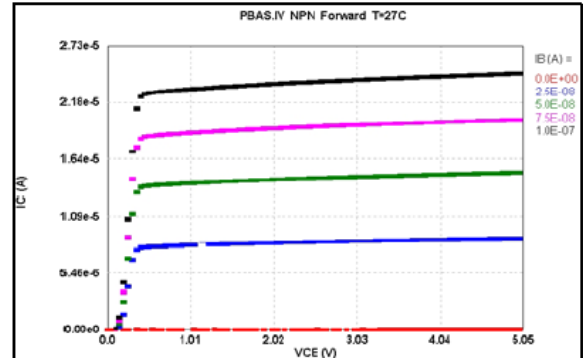
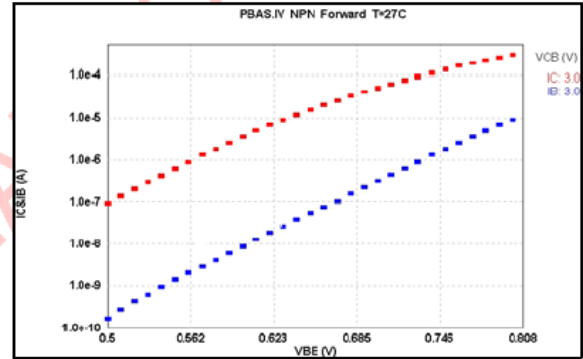
## PBAS LPNP with guarding

$\phi=7.0\ \mu\text{m}$ ,  $W_b=12.0\ \mu\text{m}$

### Layout



### I-V curve

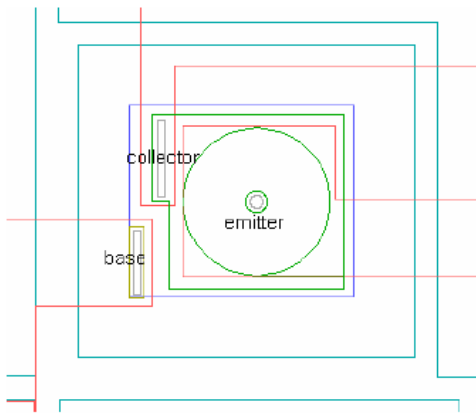


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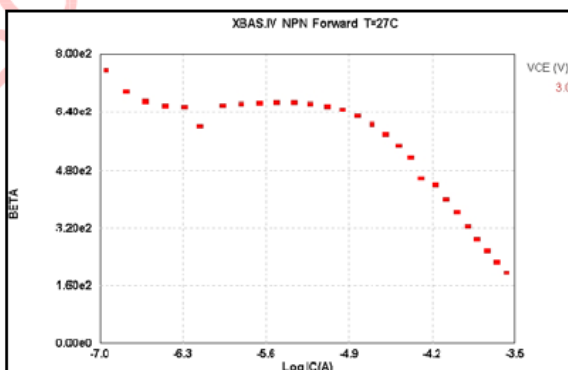
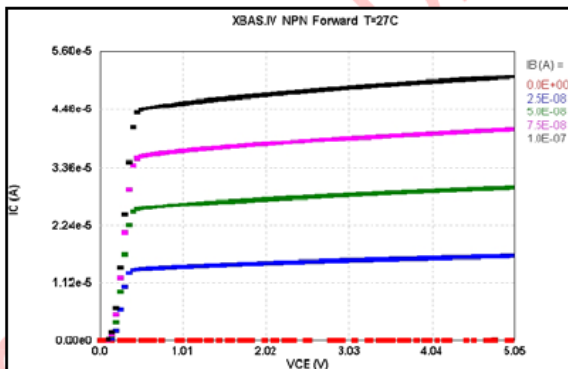
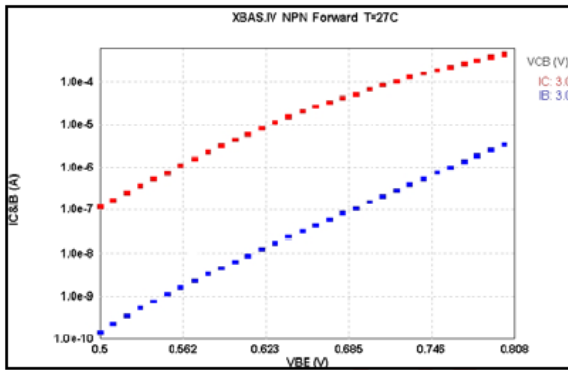
## XBAS LPNP without guarding

$\phi = 5.0 \text{ um}$ ,  $W_b = 14.0 \text{ um}$

### Layout



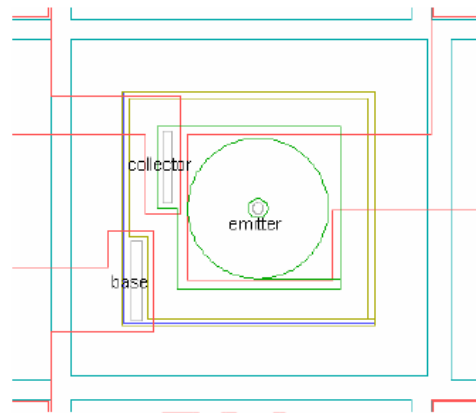
### I-V curve



## XBAS LPNP with guarding

$\phi = 5.0 \text{ um}$ ,  $W_b = 16.0 \text{ um}$

### Layout



### I-V curve

