

# UNRL110/111/113/114/115

## Silicon PNP epitaxial planer type

For digital circuit

### ■ Features

- Mold leadless type package, allowing downsizing and thinning of the equipment and automatic insertion through the tape packing.
- The PCB mounting area is 1/10 of that of lead type package (3-pin MINI-type package).

### ■ Resistance by Part Number

	Marking Symbol	(R <sub>1</sub> )	(R <sub>2</sub> )
• UNRL110	P	47 kΩ	—
• UNRL111	A	10 kΩ	10 kΩ
• UNRL113	B	47 kΩ	47 kΩ
• UNRL114	R	10 kΩ	47 kΩ
• UNRL115	M	10 kΩ	—

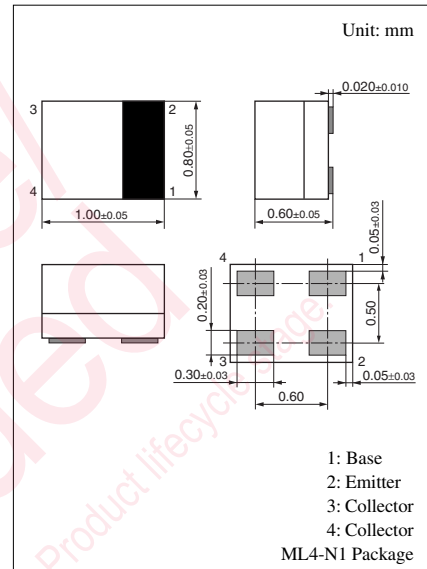
### ■ Absolute Maximum Ratings T<sub>a</sub> = 25°C

Parameter	Symbol	Rating	Unit
Collector to base voltage	V <sub>CB0</sub>	-50	V
Collector to emitter voltage	V <sub>CE0</sub>	-50	V
Collector current	I <sub>C</sub>	-100	mA
Total power dissipation *	P <sub>T</sub>	150	mW
Junction temperature	T <sub>j</sub>	125	°C
Storage temperature	T <sub>stg</sub>	-55 to +125	°C

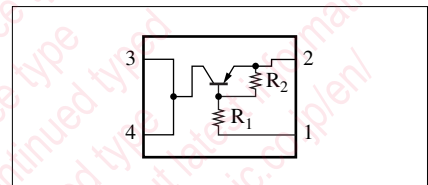
Note) \*: Printed circuit board copper foil for collector portion  
area: 20.0 mm<sup>2</sup> or more, thickness: 1.6 mm

### ■ Electrical Characteristics T<sub>a</sub> = 25°C ± 3°C

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector cutoff current	I <sub>CB0</sub>	V <sub>CB</sub> = -50 V, I <sub>E</sub> = 0			-0.1	μA
	I <sub>CE0</sub>	V <sub>CE</sub> = -50 V, I <sub>B</sub> = 0			-0.5	
Emitter cutoff current	I <sub>EBO</sub>	V <sub>EB</sub> = -6 V, I <sub>C</sub> = 0			-0.5	mA
					-0.2	
					-0.1	
					-0.01	
Collector to base voltage	V <sub>CB0</sub>	I <sub>C</sub> = -10 μA, I <sub>E</sub> = 0	-50			V
Collector to emitter voltage	V <sub>CE0</sub>	I <sub>C</sub> = -2 mA, I <sub>B</sub> = 0	-50			V
Forward current transfer ratio	h <sub>FE</sub>	V <sub>CE</sub> = -10 V, I <sub>C</sub> = -5 mA	35			
			80			
			160	460		
Collector to emitter saturation voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> = -10 mA, I <sub>B</sub> = -0.3 mA			-0.25	V



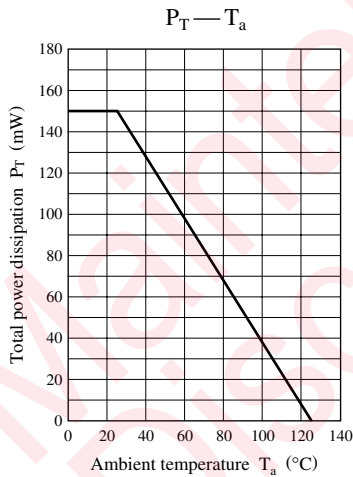
### Internal Connection



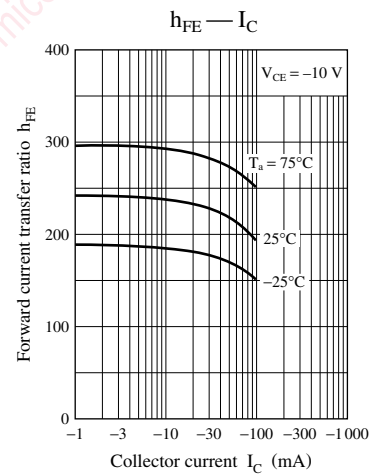
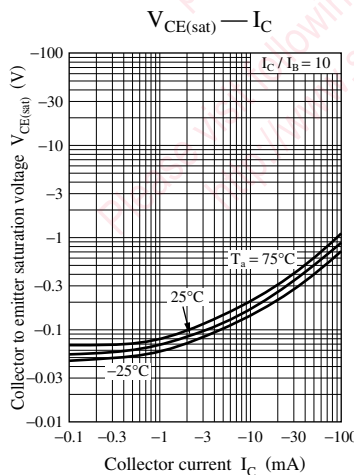
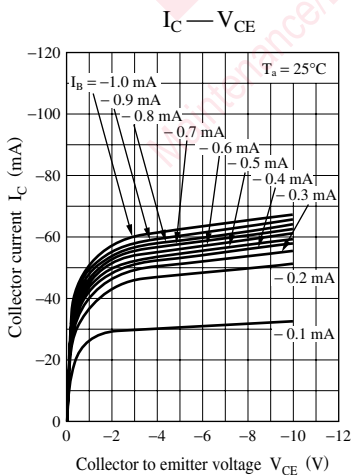
■ Electrical Characteristics(continued)  $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

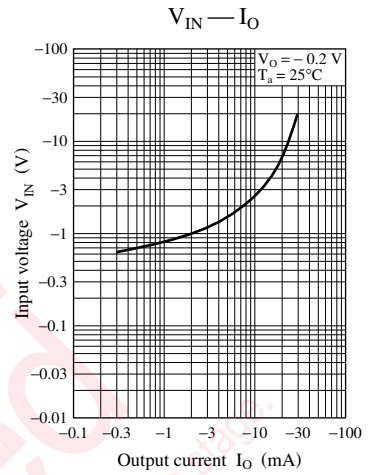
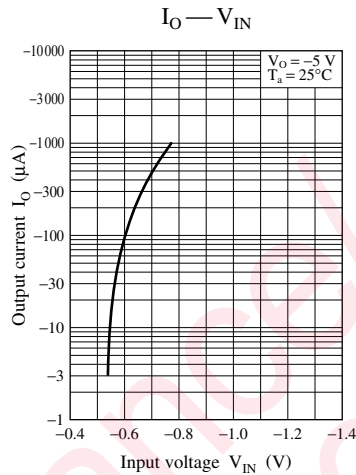
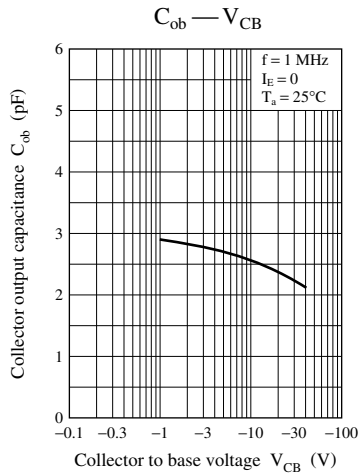
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
High-level output voltage	$V_{OH}$	$V_{CC} = -5\text{ V}, V_B = -0.5\text{ V}, R_L = 1\text{ k}\Omega$	-4.9			V
Low-level output voltage	$V_{OL}$	$V_{CC} = -5\text{ V}, V_B = -2.5\text{ V}, R_L = 1\text{ k}\Omega$			-0.2	V
		$V_{CC} = -5\text{ V}, V_B = -3.5\text{ V}, R_L = 1\text{ k}\Omega$				
Transition frequency	$f_T$	$V_{CB} = -10\text{ V}, I_E = 1\text{ mA}, f = 200\text{ MHz}$		80		MHz
Input resistance	UNRL111/114/115	$R_1$	-30%	10	+30%	$\text{k}\Omega$
	UNRL110/113			47		
Resistance ratio	UNRL111/113	$R_1/R_2$	0.8	1.0	1.2	
	UNRL114		0.17	0.21	0.25	

Common characteristics chart

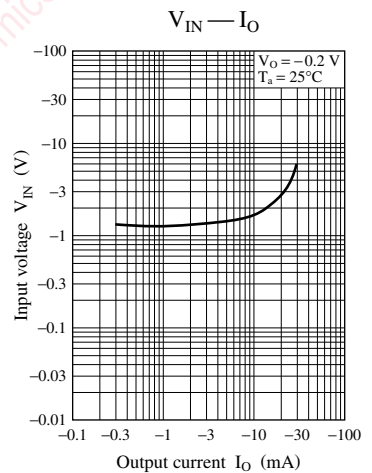
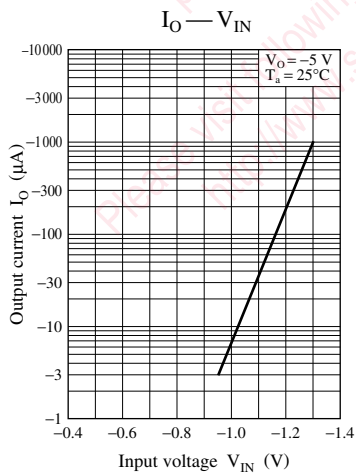
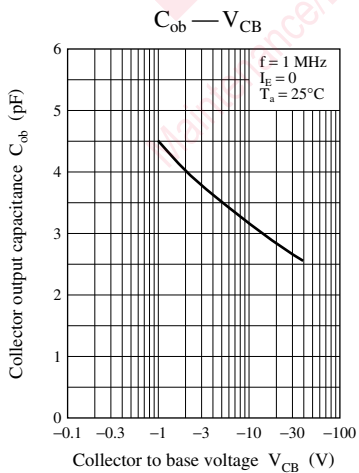
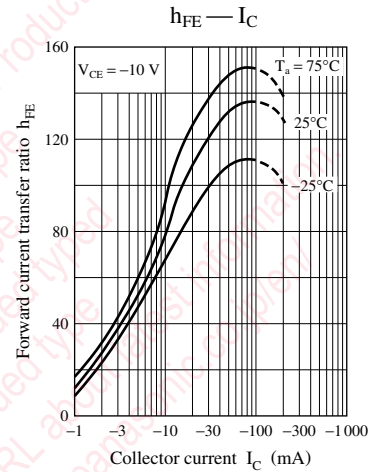
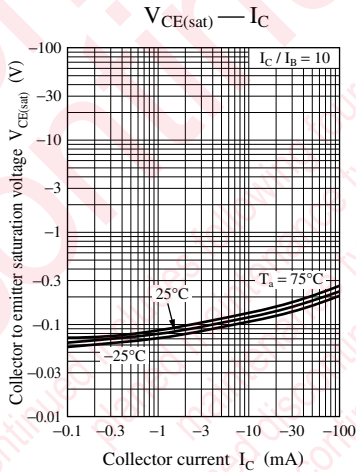
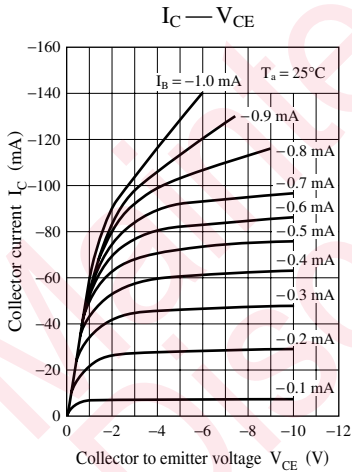


Characteristics charts of UNRL110

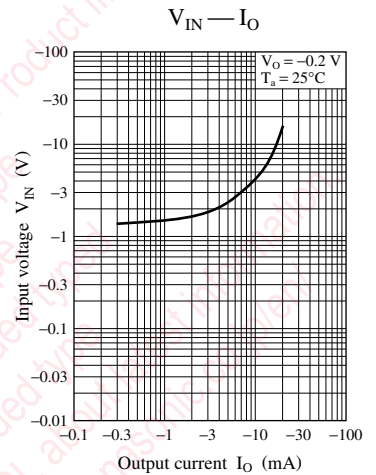
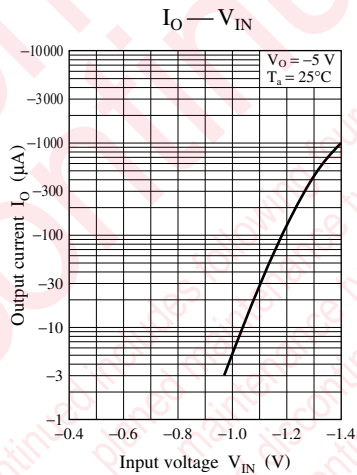
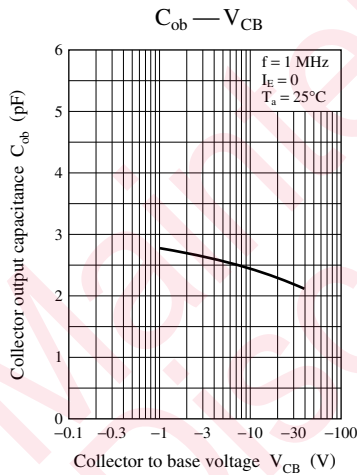
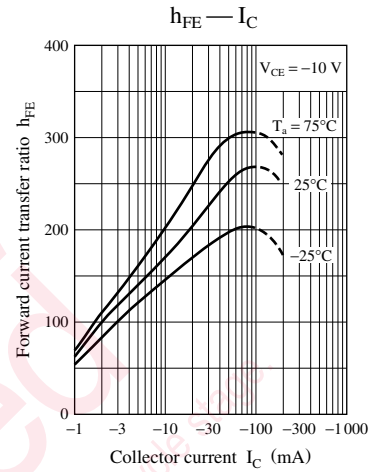
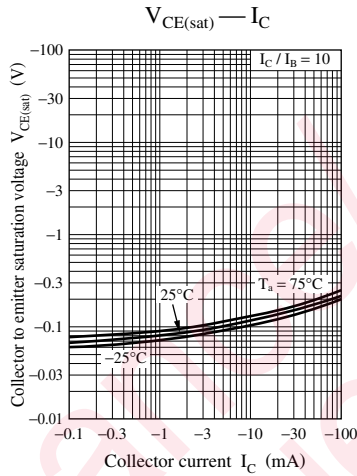
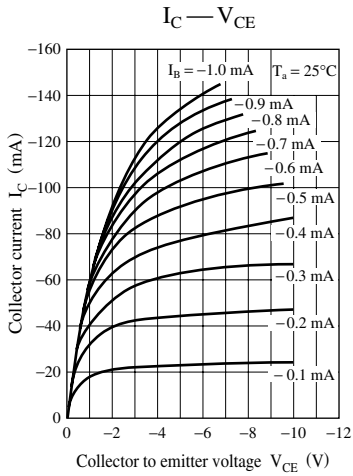




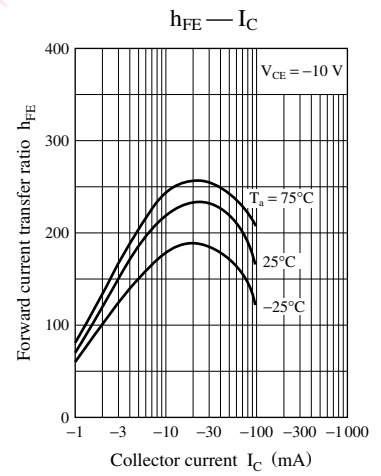
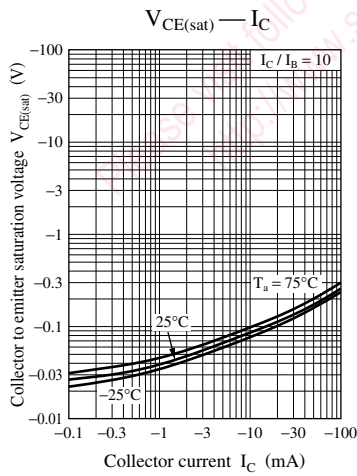
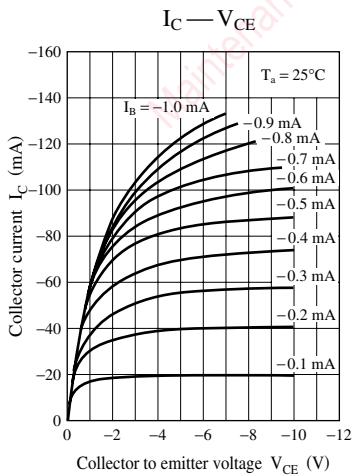
Characteristics charts of UNRL111

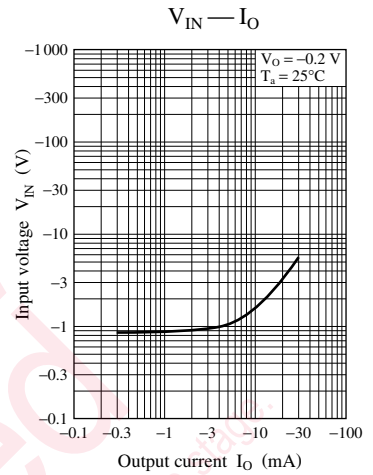
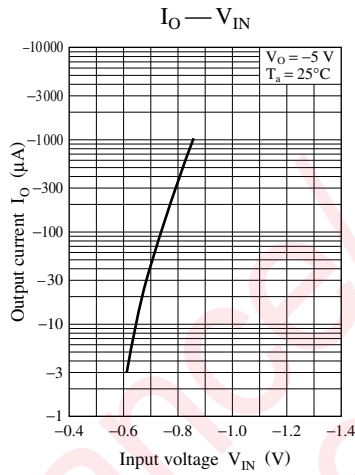
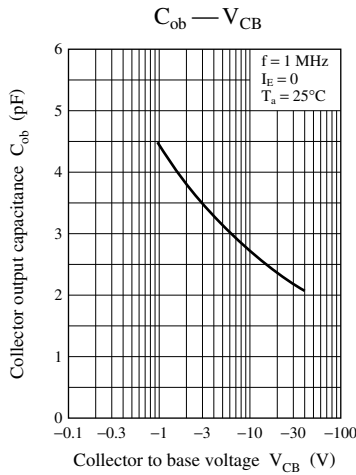


Characteristics charts of UNRL113

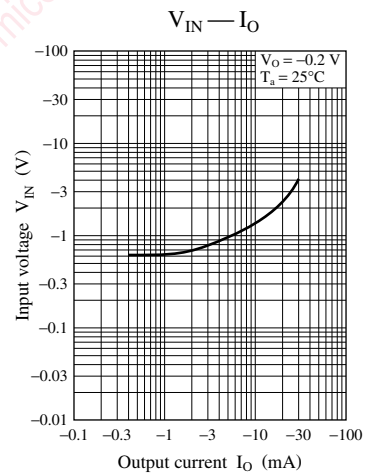
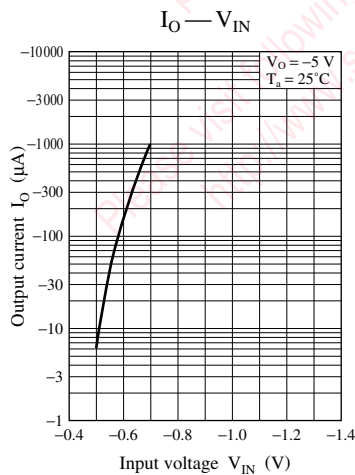
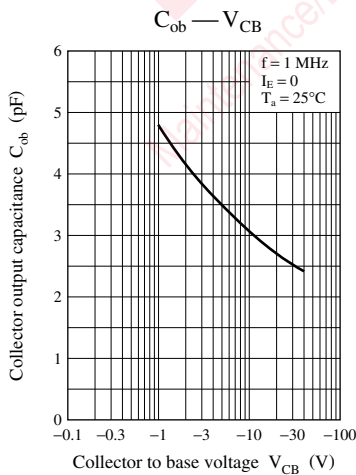
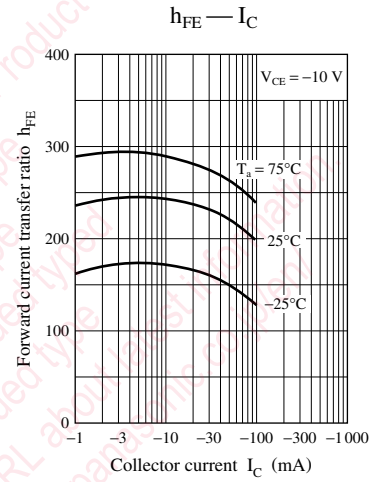
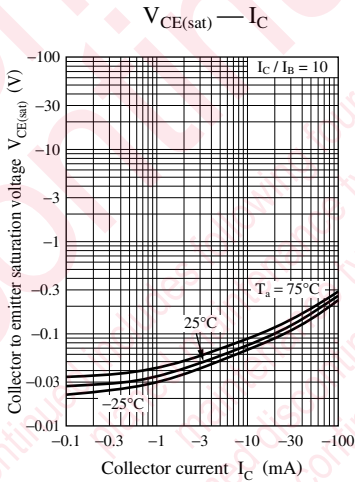
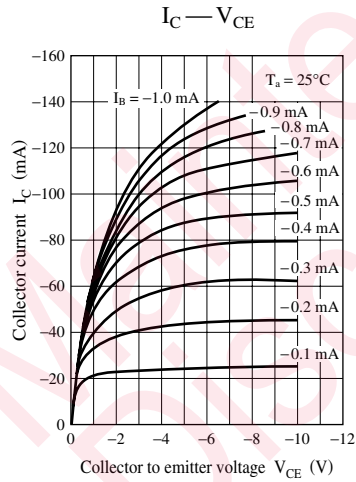


Characteristics charts of UNRL114





Characteristics charts of UNRL115



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