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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 ₁)	(R ₂)
• 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	—

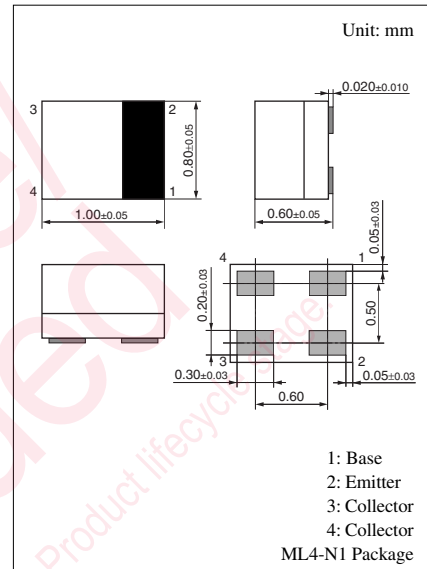
■ Absolute Maximum Ratings T_a = 25°C

Parameter	Symbol	Rating	Unit
Collector to base voltage	V _{CB0}	-50	V
Collector to emitter voltage	V _{CEO}	-50	V
Collector current	I _C	-100	mA
Total power dissipation *	P _T	150	mW
Junction temperature	T _J	125	°C
Storage temperature	T _{stg}	-55 to +125	°C

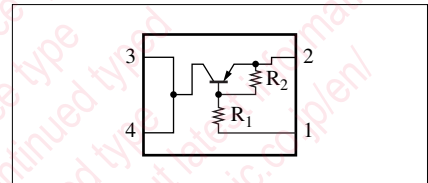
Note) *: Printed circuit board copper foil for collector portion
area: 20.0 mm² or more, thickness: 1.6 mm

■ Electrical Characteristics T_a = 25°C ± 3°C

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector cutoff current	I _{CBO}	V _{CB} = -50 V, I _E = 0			-0.1	μA
	I _{CEO}	V _{CE} = -50 V, I _B = 0			-0.5	
Emitter cutoff current	I _{EBO}	V _{EB} = -6 V, I _C = 0			-0.5	mA
					-0.2	
					-0.1	
					-0.01	
Collector to base voltage	V _{CB0}	I _C = -10 μA, I _E = 0	-50			V
Collector to emitter voltage	V _{CEO}	I _C = -2 mA, I _B = 0	-50			V
Forward current transfer ratio	h _{FE}	V _{CE} = -10 V, I _C = -5 mA	35			
			80			
			160	460		
Collector to emitter saturation voltage	V _{CE(sat)}	I _C = -10 mA, I _B = -0.3 mA			-0.25	V



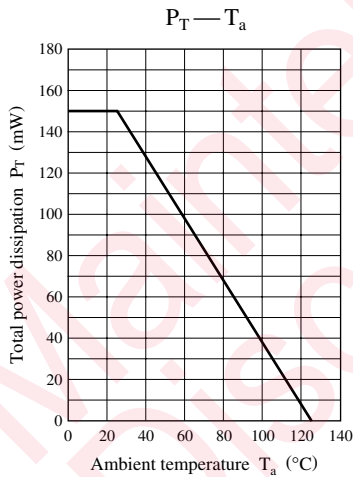
Internal Connection



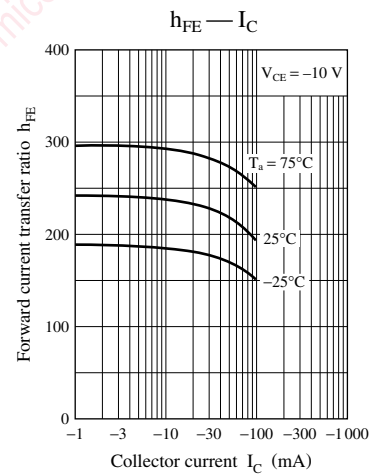
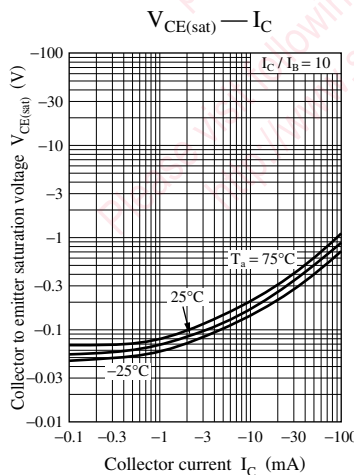
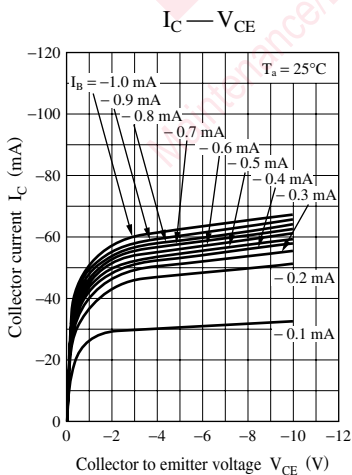
■ Electrical Characteristics(continued) $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

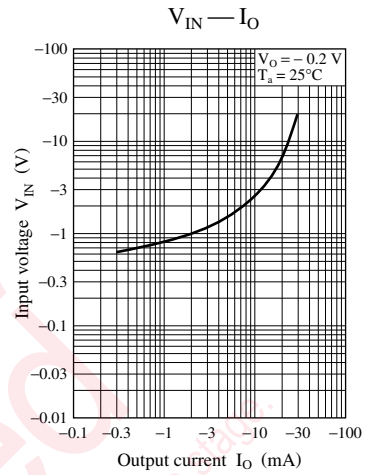
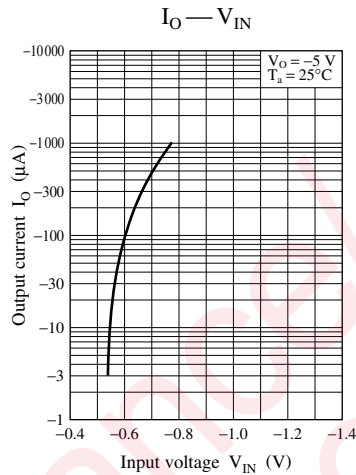
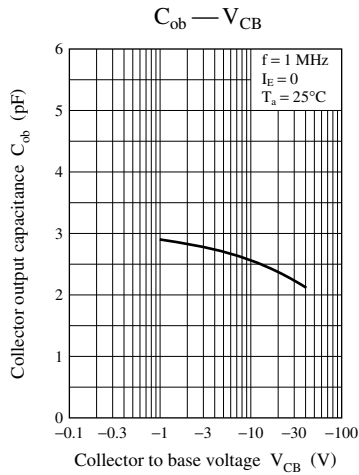
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
High-level output voltage	V_{OH}	$V_{CC} = -5\text{ V}, V_B = -0.5\text{ V}, R_L = 1\text{ k}\Omega$	-4.9			V
Low-level output voltage	V_{OL}	$V_{CC} = -5\text{ V}, V_B = -2.5\text{ V}, R_L = 1\text{ k}\Omega$			-0.2	V
		$V_{CC} = -5\text{ V}, V_B = -3.5\text{ V}, R_L = 1\text{ k}\Omega$				
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%	k Ω
	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

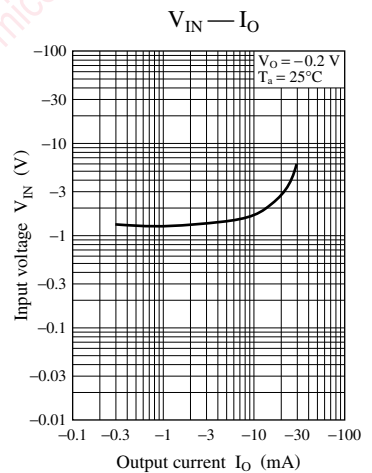
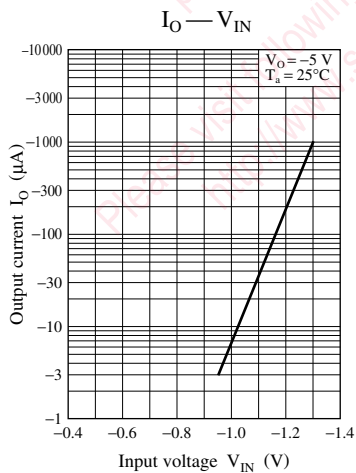
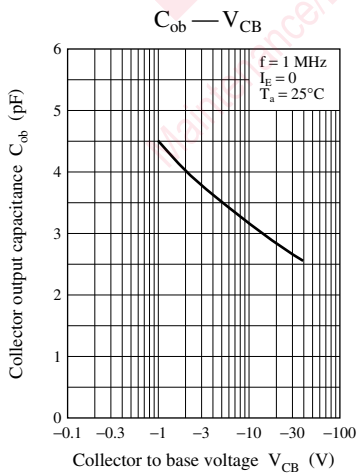
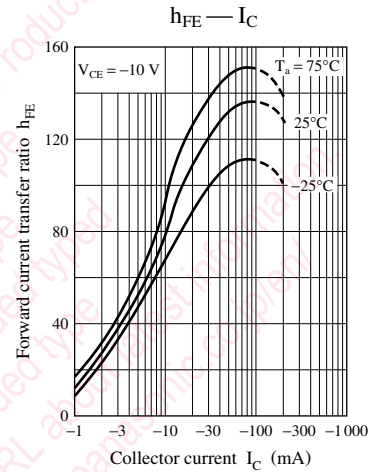
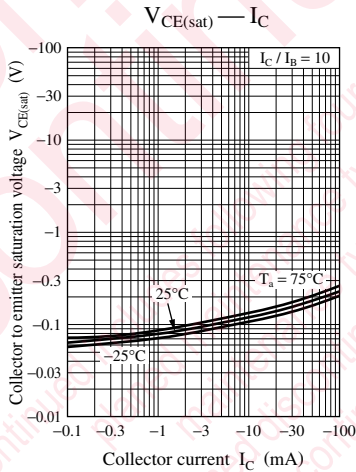
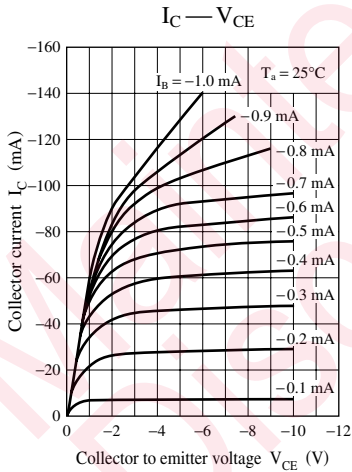


Characteristics charts of UNRL110

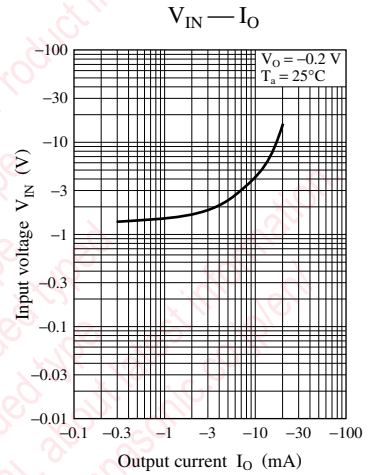
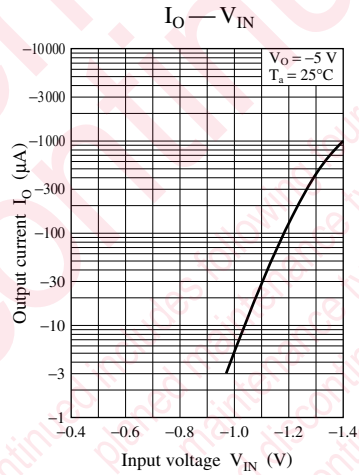
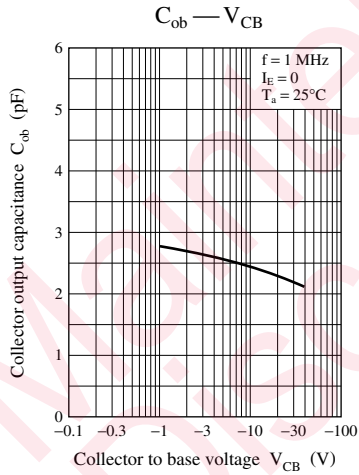
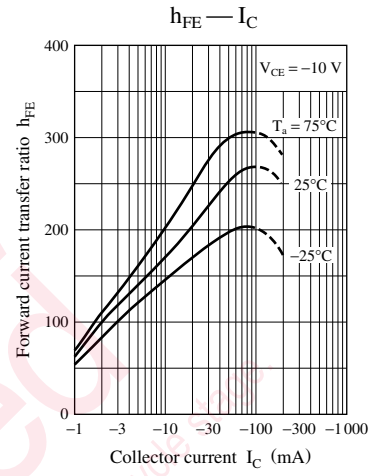
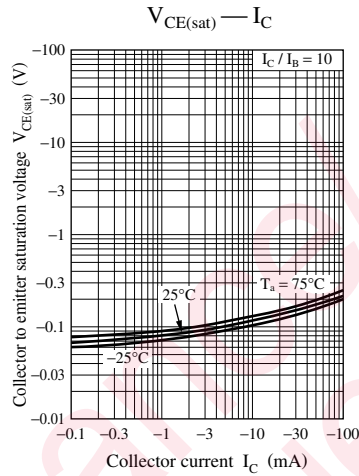
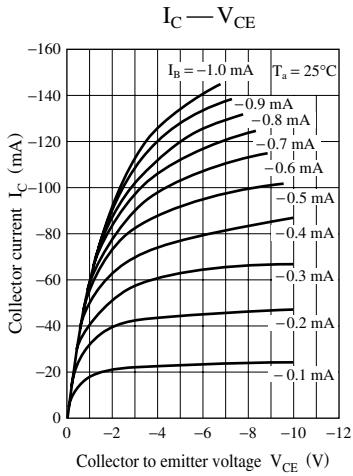




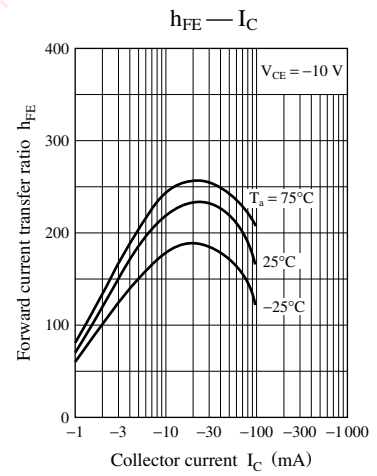
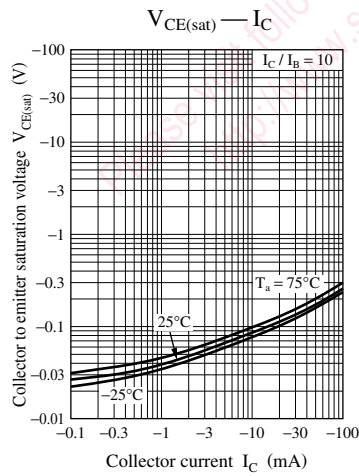
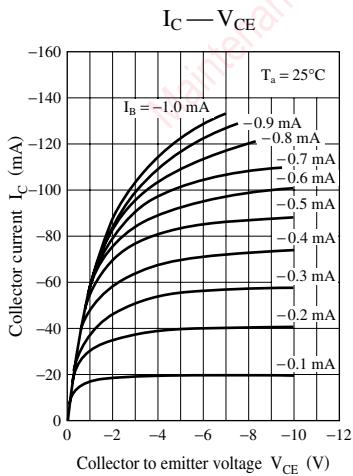
Characteristics charts of UNRL111

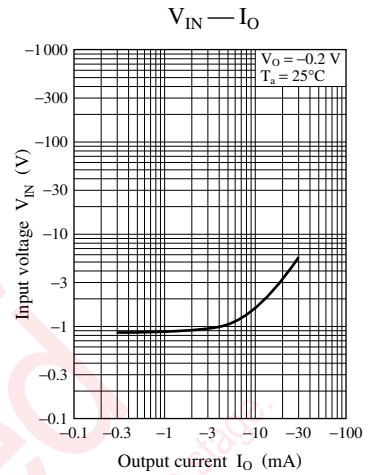
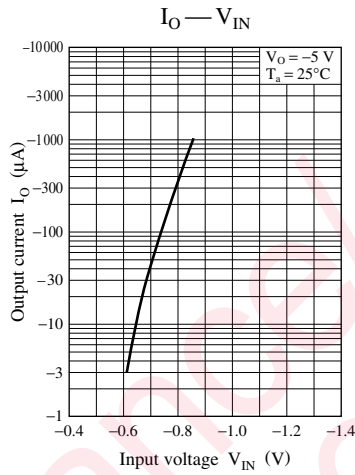
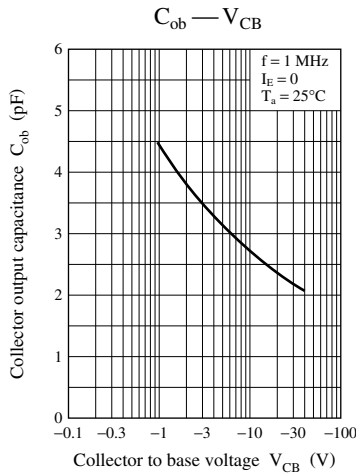


Characteristics charts of UNRL113

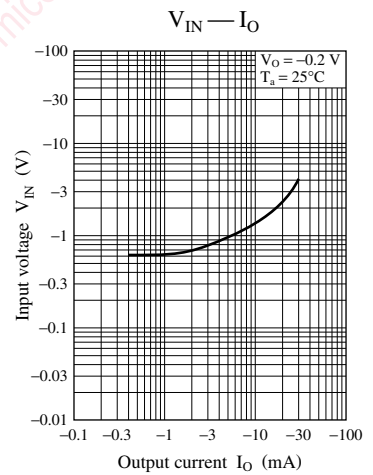
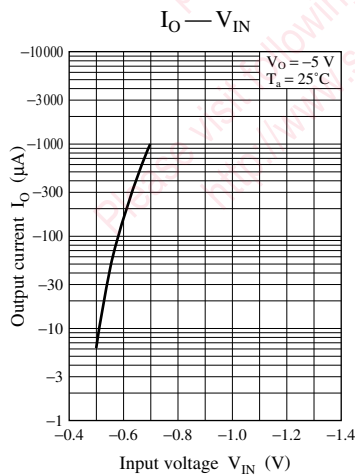
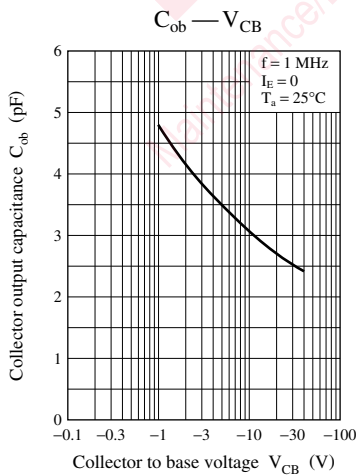
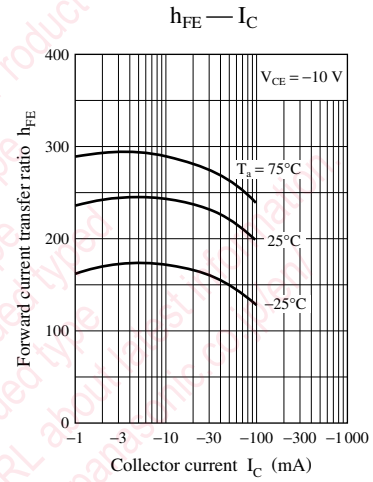
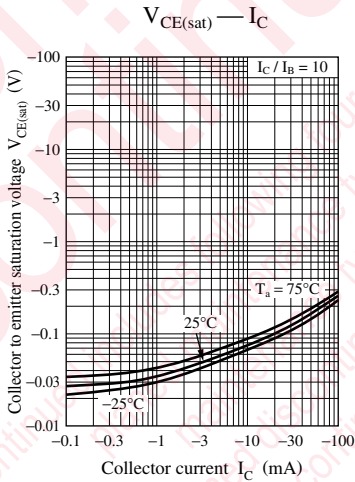
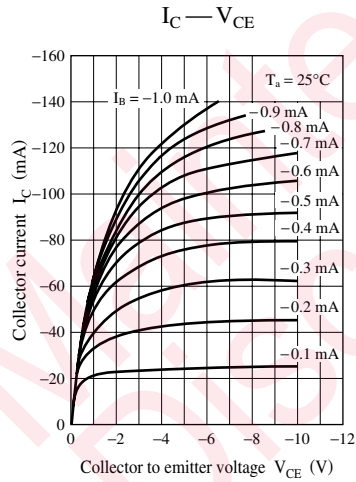


Characteristics charts of UNRL114





Characteristics charts of UNRL115



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