

UNRL210/211/213/214/215/216

Silicon NPN 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

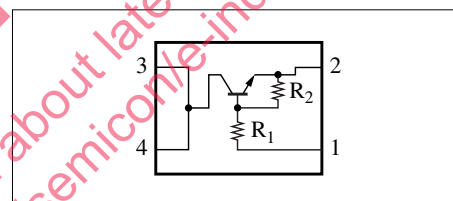
	Marking Symbol	(R ₁)	(R ₂)
• UNRL210	P	47 kΩ	—
• UNRL211	A	10 kΩ	10 kΩ
• UNRL213	B	47 kΩ	47 kΩ
• UNRL214	R	10 kΩ	47 kΩ
• UNRL215	M	10 kΩ	—
• UNRL216	N	4.7 kΩ	—



■ Absolute Maximum Ratings T_a = 25°C

Parameter	Symbol	Rating	Unit
Collector to base voltage	V _{CBO}	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

Internal Connection



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
		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 _{CBO}	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	UNRL211	V _{CE} = 10 V, I _C = 5 mA	35			
	UNRL213/214		80			
	UNRL210/215/216		160	460		
Collector to emitter saturation voltage	V _{CE(sat)}	I _C = 10 mA, I _B = 0.3 mA			0.25	V

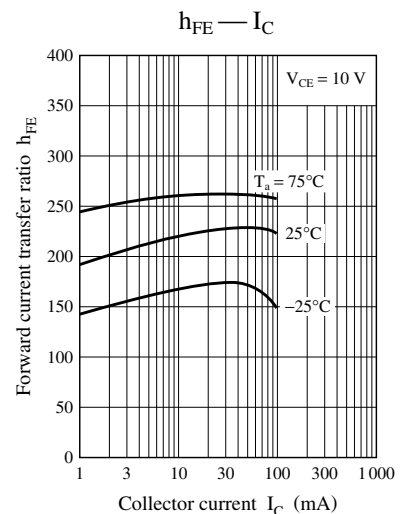
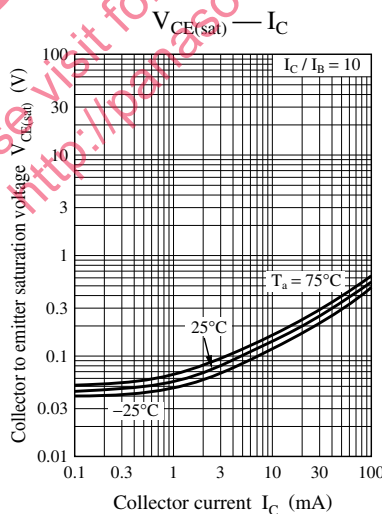
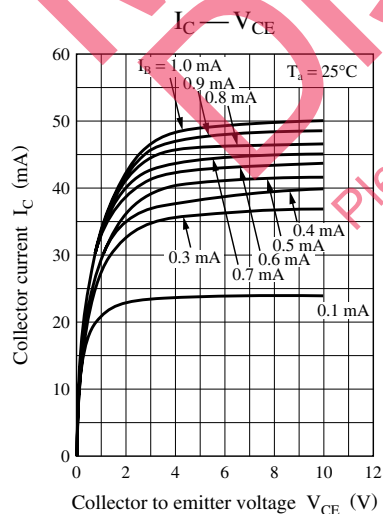
■ Electrical Characteristics(continued) $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

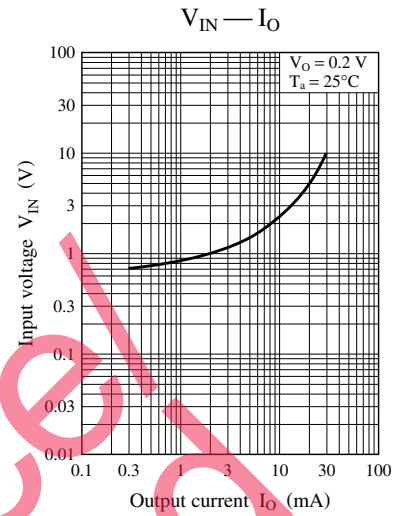
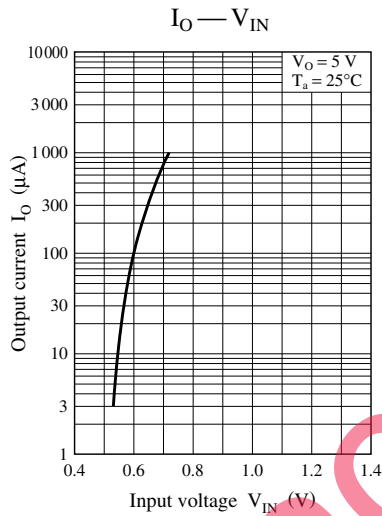
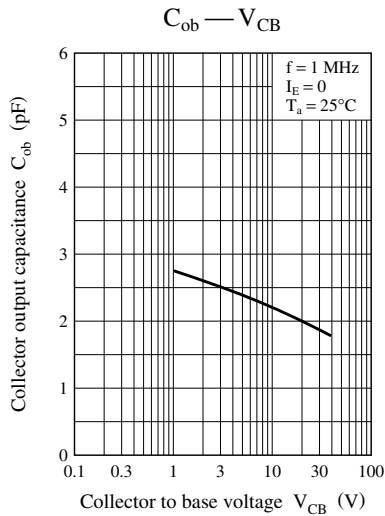
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
High-level output voltage	V_{OH}	$V_{CC} = 5\text{ V}, V_B = 0.5\text{ V}, R_L = 1\text{ k}\Omega$	4.9			V
Low-level output voltage	V_{OL}	$V_{CC} = 5\text{ V}, V_B = 2.5\text{ V}, R_L = 1\text{ k}\Omega$			0.2	V
		$V_{CC} = 5\text{ V}, V_B = 3.5\text{ V}, R_L = 1\text{ k}\Omega$				
Transition frequency	f_T	$V_{CB} = 10\text{ V}, I_E = -2\text{ mA}, f = 200\text{ MHz}$		150		MHz
Input resistance	UNRL216	R_1	-30%	4.7	+30%	k Ω
	UNRL211/214/215			10		
	UNRL210/213			47		
Resistance ratio	UNRL211/213	R_1/R_2	0.8	1.0	1.2	
	UNRL214		0.17	0.21	0.25	

Common characteristics chart

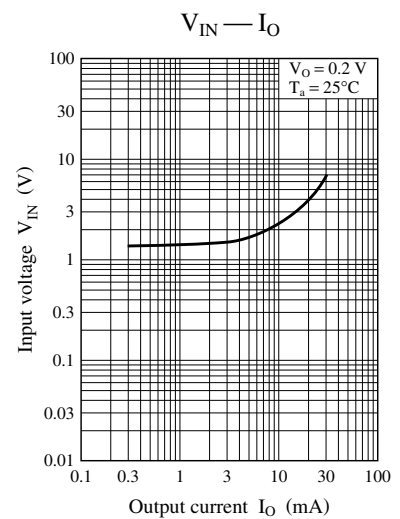
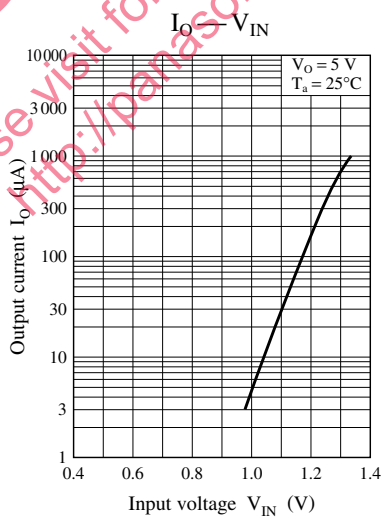
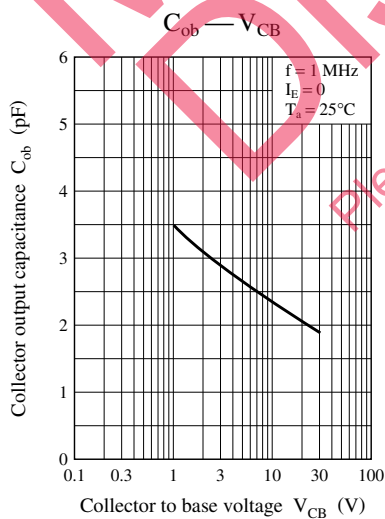
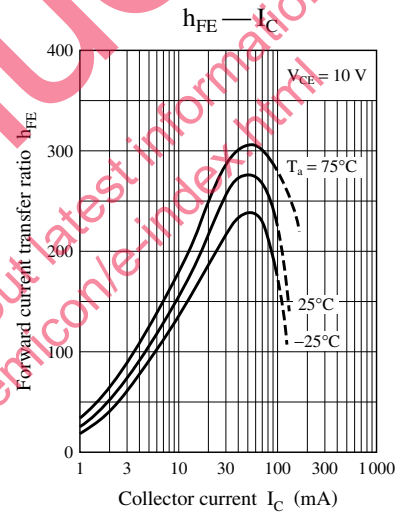
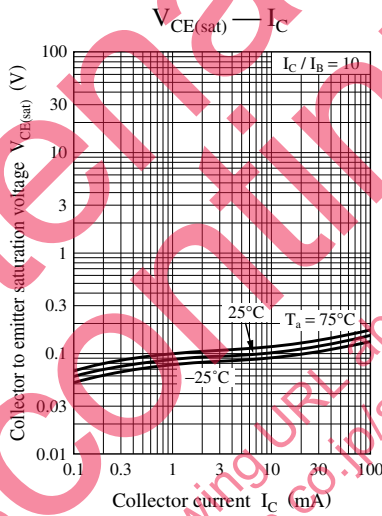
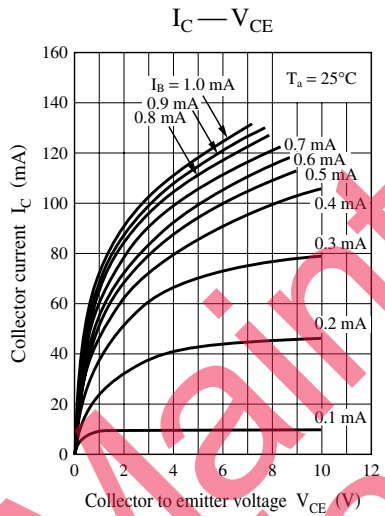


Characteristics charts of UNRL210

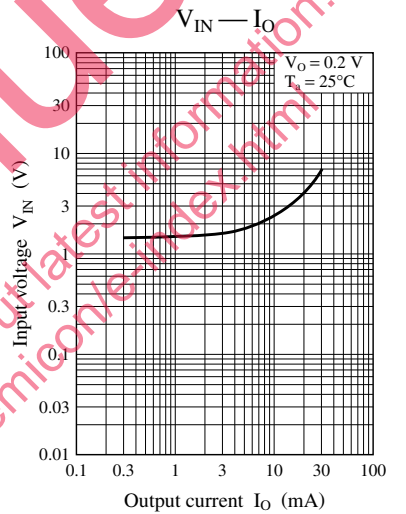
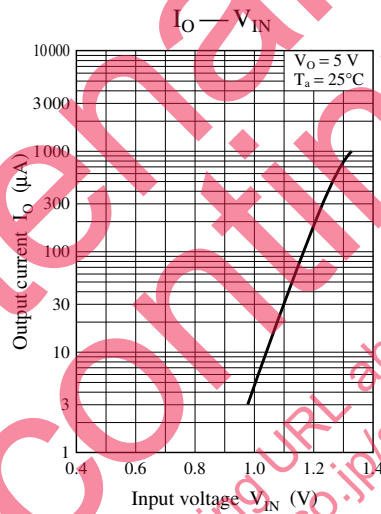
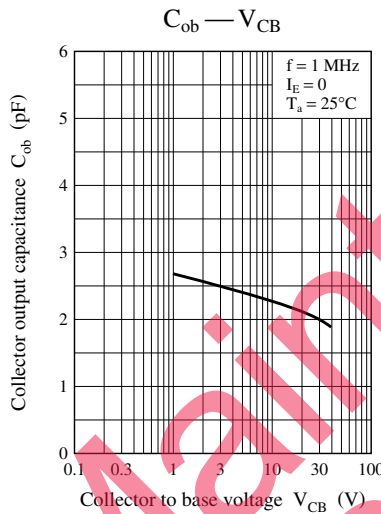
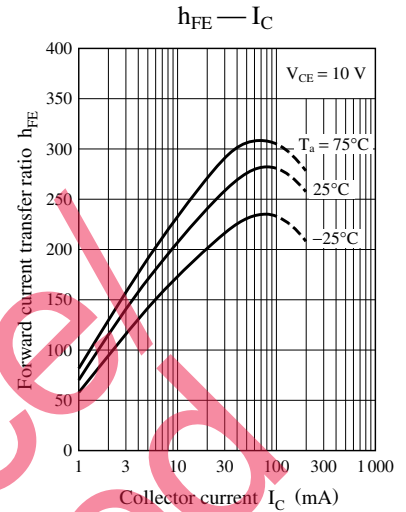
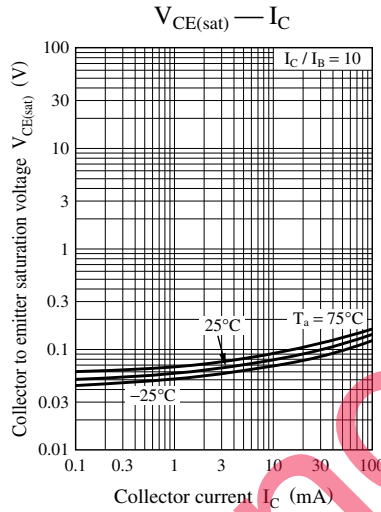
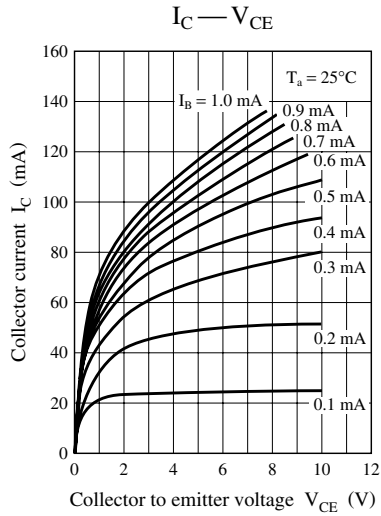




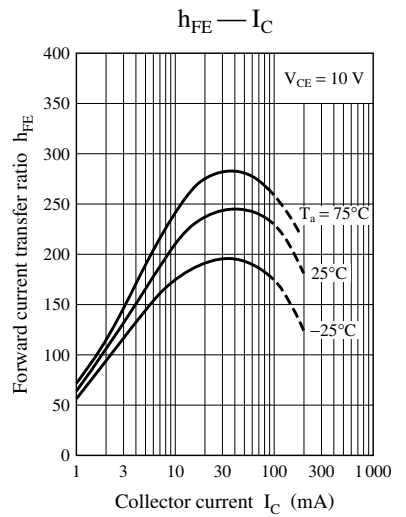
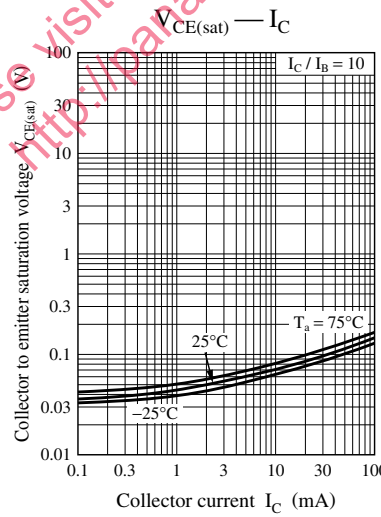
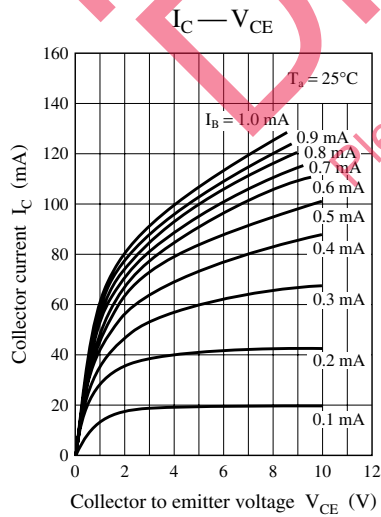
Characteristics charts of UNRL211

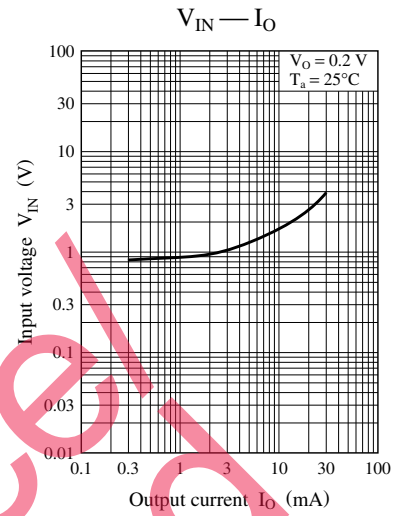
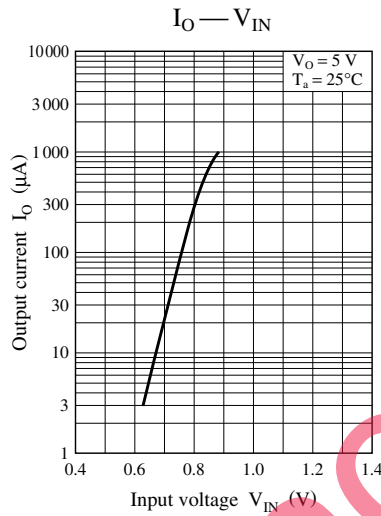
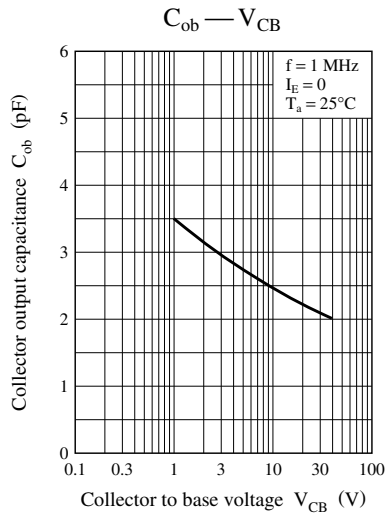


Characteristics charts of UNRL213

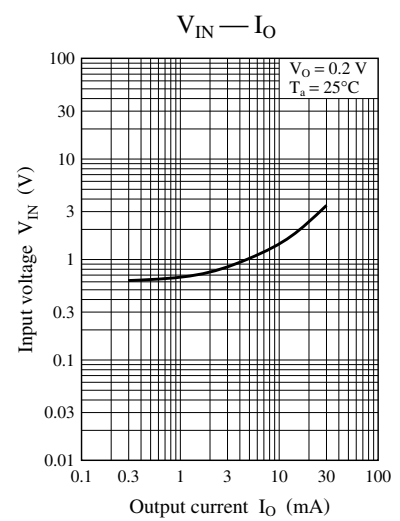
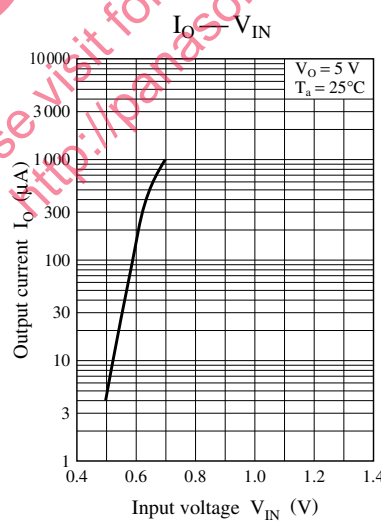
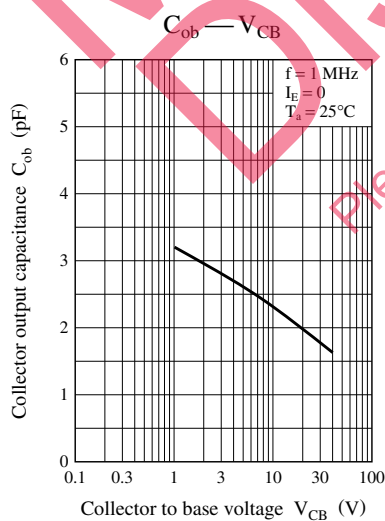
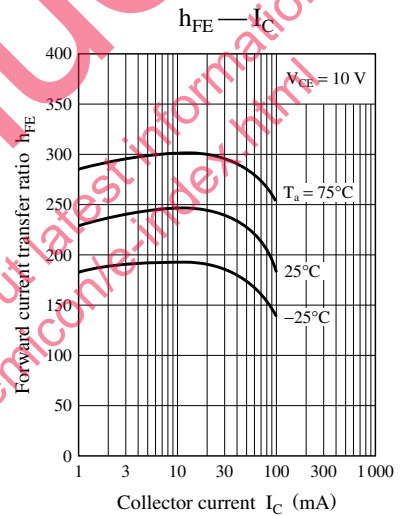
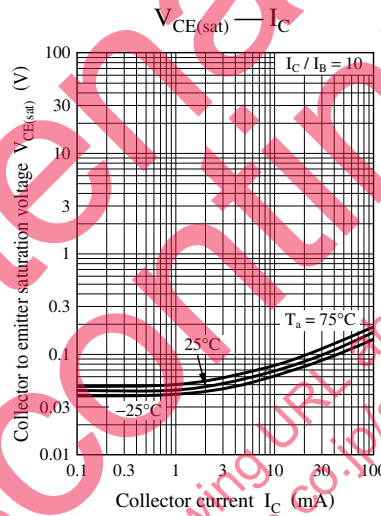
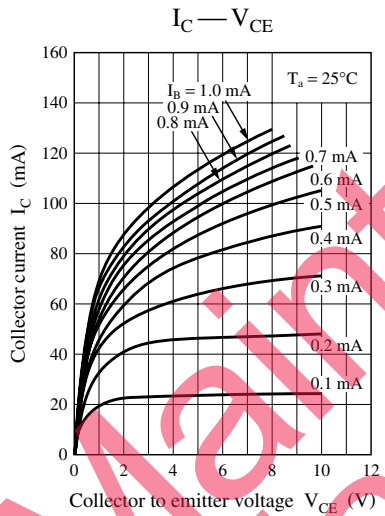


Characteristics charts of UNRL214

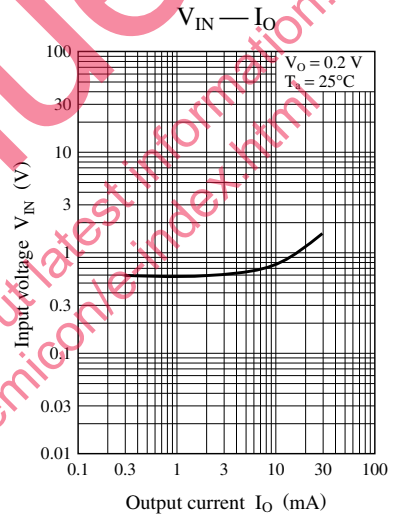
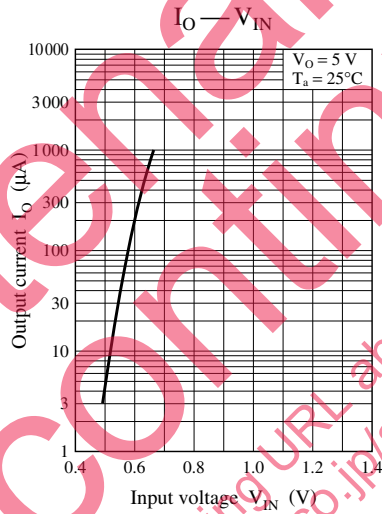
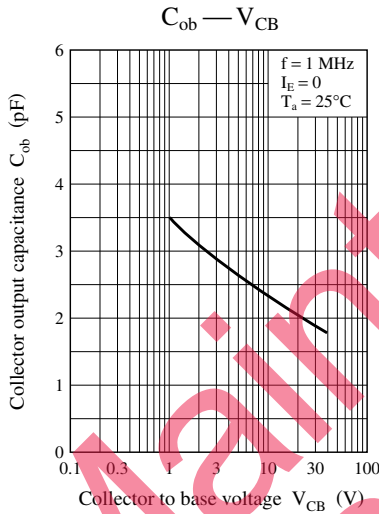
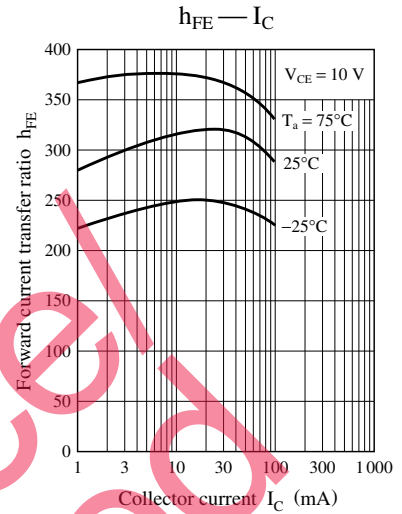
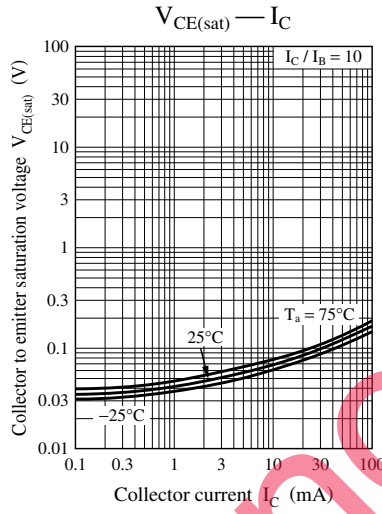
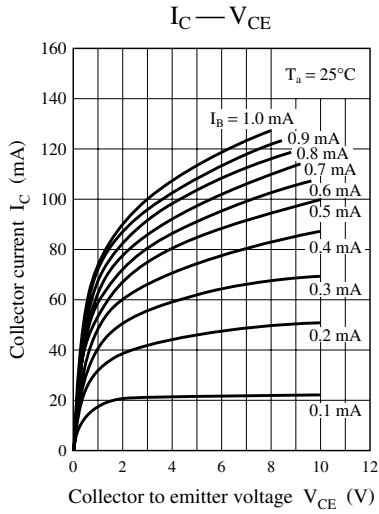




Characteristics charts of UNRL215



Characteristics charts of UNRL216



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