UP03396

Silicon NPN epitaxial planar type (Tr1) Silicon PNP epitaxial planar type (Tr2)

For digital circuits

■ Features

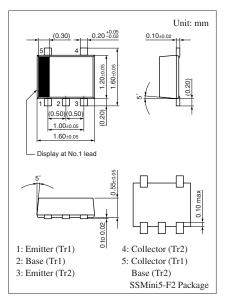
- Two elements incorporated into one package (Transistors with built-in resistor)
- Reduction of the mounting area and assembly cost by one half

■ Basic Part Number

• UNR111T + UNR1211

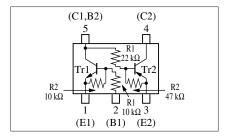
■ Absolute Maximum Ratings $T_a = 25$ °C

	Parameter	Symbol	Rating	Unit	
Tr1	Collector-base voltage (Emitter open)	V _{CBO}	50	V	
	Collector-emitter voltage (Base open)	V _{CEO}	50	V	
	Collector current	I_C	100	mA	
Tr2	Collector-base voltage (Emitter open)	V _{CBO}	-50	V	
	Collector-emitter voltage (Base open)	V _{CEO}	-50	V	
	Collector current	I_C	-100	mA	
Overall	Total power dissipation	P_{T}	125	mW	
	Junction temperature	T_j	125	°C	
	Storage temperature	T _{stg}	-55 to +125	°C	



Marking Symbol: 6P

Internal Connection



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

• Tr1

Parameter	Symbol	Conditions	Min	Тур	Max	Unit
Collector-base voltage (Emitter open)	V _{CBO}	$I_C = 10 \mu\text{A}, I_E = 0$	50			V
Collector-emitter voltage (Base open)	V _{CEO}	$I_C = 2 \text{ mA}, I_B = 0$	50			V
Collector-base cutoff current (Emitter open)	I_{CBO}	$V_{CB} = 50 \text{ V}, I_{E} = 0$			0.1	μΑ
Collector-emitter cutoff current (Base open)	I _{CEO}	$V_{CE} = 50 \text{ V}, I_{B} = 0$			0.5	μΑ
Emitter-base cutoff current (Collector open)	I_{EBO}	$V_{EB} = 6 \text{ V}, I_C = 0$			0.5	mA
Forward current transfer ratio	h_{FE}	$V_{CE} = 10 \text{ V}, I_{C} = 5 \text{ mA}$	35			_
Collector-emitter saturation voltage	V _{CE(sat)}	$I_C = 10 \text{ mA}, I_B = 0.3 \text{ mA}$			0.25	V
Output voltage high-level	V _{OH}	$V_{CC} = 5 \text{ V}, V_{B} = 0.5 \text{ V}, R_{L} = 1 \text{ k}\Omega$	4.9			V
Output voltage low-level	V _{OL}	$V_{CC} = 5 \text{ V}, V_{B} = 2.5 \text{ V}, R_{L} = 1 \text{ k}\Omega$			0.2	V
Input resistance	R ₁		-30%	10	+30%	kΩ
Resistance ratio	R_1 / R_2		0.8	1.0	1.2	
Transition frequency	f_T	$V_{CB} = 10 \text{ V}, I_E = -2 \text{ mA}, f = 200 \text{ MHz}$		150		MHz

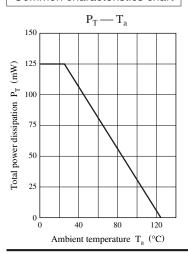
 $Note)\ Measuring\ methods\ are\ based\ on\ JAPANESE\ INDUSTRIAL\ STANDARD\ JIS\ C\ 7030\ measuring\ methods\ for\ transistors.$

• Tr2

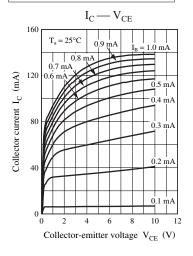
Parameter	Symbol	Conditions	Min	Тур	Max	Unit
Collector-base voltage (Emitter open)	V _{CBO}	$I_C = -10 \ \mu A, I_E = 0$	-50			V
Collector-emitter voltage (Base open)	V _{CEO}	$I_C = -2 \text{ mA}, I_B = 0$	-50			V
Collector-base cutoff current (Emitter open)	I_{CBO}	$V_{CB} = -50 \text{ V}, I_E = 0$			- 0.1	μΑ
Collector-emitter cutoff current (Base open)	I_{CEO}	$V_{CE} = -50 \text{ V}, I_{B} = 0$			- 0.5	μΑ
Emitter-base cutoff current (Collector open)	I_{EBO}	$V_{EB} = -6 \text{ V}, I_C = 0$			- 0.2	mA
Forward current transfer ratio	h _{FE}	$V_{CE} = -10 \text{ V}, I_{C} = -5 \text{ mA}$	80		400	_
Collector-emitter saturation voltage	V _{CE(sat)}	$I_C = -10 \text{ mA}, I_B = -0.3 \text{ mA}$			- 0.25	V
Output voltage high-level	V _{OH}	$V_{CC} = -5 \text{ V}, V_B = -0.5 \text{ V}, R_L = 1 \text{ k}\Omega$	-4.9			V
Output voltage low-level	V _{OL}	$V_{CC} = -5 \text{ V}, V_B = -2.5 \text{ V}, R_L = 1 \text{ k}\Omega$			- 0.2	V
Input resistance	R ₁		-30%	22	+30%	kΩ
Resistance ratio	R_1/R_2			0.47		_
Transition frequency	f_T	$V_{CB} = -10 \text{ V}, I_E = 1 \text{ mA}, f = 200 \text{ MHz}$		80		MHz

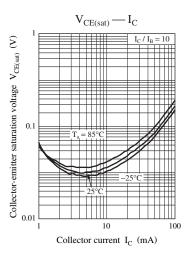
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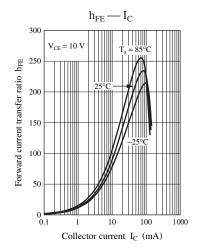
Common characteristics chart

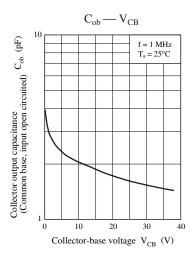


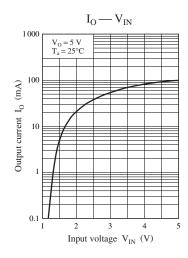
Characteristics charts of Tr1

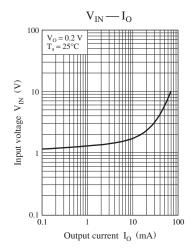






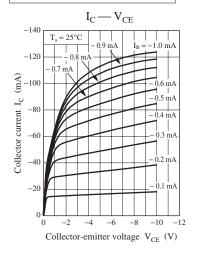


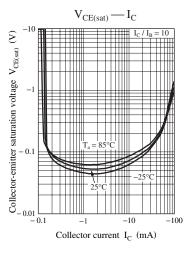


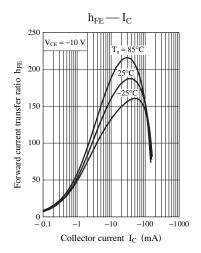


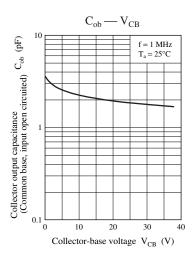
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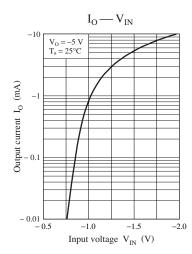
Characteristics charts of Tr2

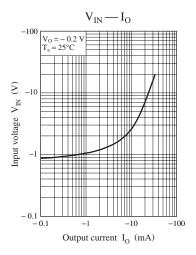












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