

# UNR921xG Series

## Silicon NPN epitaxial planar type

For digital circuits

### ■ Features

- Costs can be reduced through downsizing of the equipment and reduction of the number of parts.
- SS-Mini type package, allowing automatic insertion through tape packing.

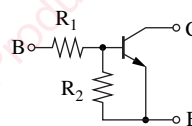
### ■ Resistance by Part Number

	Marking Symbol	(R <sub>1</sub> )	(R <sub>2</sub> )
• UNR9210G	8L	47 kΩ	—
• UNR9211G	8A	10 kΩ	10 kΩ
• UNR9212G	8B	22 kΩ	22 kΩ
• UNR9213G	8C	47 kΩ	47 kΩ
• UNR9214G	8D	10 kΩ	47 kΩ
• UNR9215G	8E	10 kΩ	—
• UNR9216G	8F	4.7 kΩ	—
• UNR9217G	8H	22 kΩ	—
• UNR9218G	8I	0.51 kΩ	5.1 kΩ
• UNR9219G	8K	1 kΩ	10 kΩ
• UNR921AG	8X	100 kΩ	100 kΩ
• UNR921BG	8Y	100 kΩ	—
• UNR921CG	8Z	—	47 kΩ
• UNR921DG	8M	47 kΩ	10 kΩ
• UNR921EG	8N	47 kΩ	22 kΩ
• UNR921FG	8O	4.7 kΩ	10 kΩ
• UNR921KG	8P	10 kΩ	4.7 kΩ
• UNR921LG	8Q	4.7 kΩ	4.7 kΩ
• UNR921MG	EL	2.2 kΩ	47 kΩ
• UNR921NG	EX	4.7 kΩ	47 kΩ
• UNR921TG	EZ	22 kΩ	47 kΩ
• UNR921VG	FD	2.2 kΩ	2.2 kΩ

### ■ Package

- Code  
SSMini3-F3
- Pin Name  
1: Base  
2: Emitter  
3: Collector

### ■ Internal Connection



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

Parameter	Symbol	Rating	Unit
Collector-base voltage (Emitter open)	V <sub>CBO</sub>	50	V
Collector-emitter voltage (Base open)	V <sub>CEO</sub>	50	V
Collector current	I <sub>C</sub>	100	mA
Total power dissipation	P <sub>T</sub>	125	mW
Junction temperature	T <sub>j</sub>	125	°C
Storage temperature	T <sub>stg</sub>	-55 to +125	°C

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

Parameter		Symbol	Conditions	Min	Typ	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 cut-off current (Emitter open)		$I_{CBO}$	$V_{CB} = 50 \text{ V}, I_E = 0$			0.1	$\mu\text{A}$	
Collector-emitter cut-off current (Base open)		$I_{CEO}$	$V_{CE} = 50 \text{ V}, I_B = 0$			0.5	$\mu\text{A}$	
Emitter-base cut-off current (Collector open)	UNR9210G/9215G/9216G/9217G/921BG	$I_{EBO}$	$V_{EB} = 6 \text{ V}, I_C = 0$			0.01	mA	
	UNR9213G/921AG					0.1		
	UNR9212G/9214G/921DG/921EG/921MG/921NG/921TG					0.2		
	UNR9211G					0.5		
	UNR921FG/921KG					1.0		
	UNR9219G					1.5		
	UNR9218G/921CG/921LG/921VG					2.0		
	Forward current transfer ratio			UNR921VG	$h_{FE}$	$V_{CE} = 10 \text{ V}, I_C = 5 \text{ mA}$		6
UNR9218G/921KG/921LG		20						
UNR9219G/921DG/921FG		30						
UNR9211G		35						
UNR9212G/921EG		60						
UNR9213G/9214G/921AG/921CG/921MG		80						
UNR921NG/921TG		80	400					
UNR9210G/9215G/9216G/9217G/921BG		160	460					
Collector-emitter saturation voltage		$V_{CE(sat)}$	$I_C = 10 \text{ mA}, I_B = 0.3 \text{ mA}$			0.25	V	
	UNR921VG		$I_C = 10 \text{ mA}, I_B = 1.5 \text{ mA}$					
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	
			UNR9213G/921BG/921KG	$V_{CC} = 5 \text{ V}, V_B = 3.5 \text{ V}, R_L = 1 \text{ k}\Omega$				
			UNR921DG	$V_{CC} = 5 \text{ V}, V_B = 10 \text{ V}, R_L = 1 \text{ k}\Omega$				
			UNR921EG	$V_{CC} = 5 \text{ V}, V_B = 6 \text{ V}, R_L = 1 \text{ k}\Omega$				
			UNR921AG	$V_{CC} = 5 \text{ V}, V_B = 5 \text{ V}, R_L = 1 \text{ k}\Omega$				
Transition frequency		$f_T$	$V_{CB} = 10 \text{ V}, I_E = -2 \text{ mA}, f = 200 \text{ MHz}$		150		MHz	
Input resistance	UNR9218G	$R_1$		-30%	0.51	+30%	k $\Omega$	
	UNR9219G				1			
	UNR921MG/921VG				2.2			
	UNR9216G/921FG/921LG/921NG				4.7			
	UNR9211G/9214G/9215G/921KG				10			
	UNR9212G/9217G/921TG				22			
	UNR9210G/9213G/921DG/921EG				47			
	UNR921AG/921BG				100			

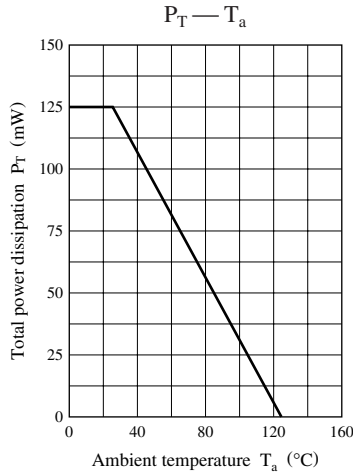
Note) Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

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

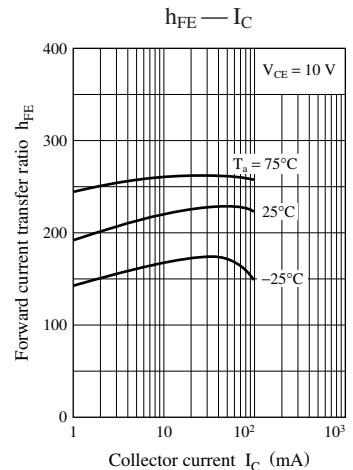
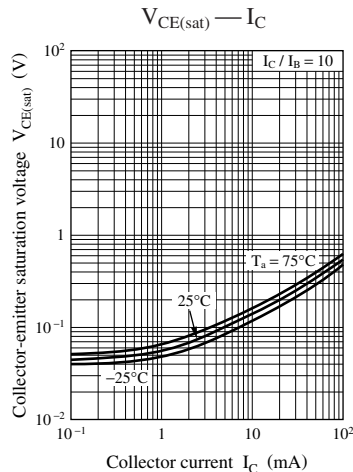
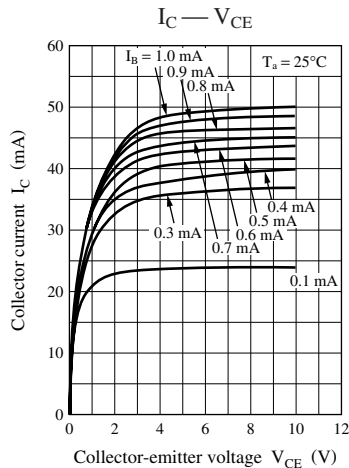
Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Emitter-base resistance	UNR921CG	$R_2$		-30%	47	+30%	k $\Omega$
Resistance ratio	UNR921MG	$R_1/R_2$			0.047		—
	UNR921NG				0.1		
	UNR9218G/9219G			0.08	0.10	0.12	
	UNR9214G			0.17	0.21	0.25	
	UNR921TG				0.47		
	UNR921FG			0.37	0.47	0.57	
	UNR921AG/921VG				1.0		
	UNR9211G/9212G/9213G/921LG			0.8	1.0	1.2	
	UNR921KG			1.70	2.13	2.60	
	UNR921EG			1.70	2.14	2.60	
UNR921DG		3.7	4.7	5.7			

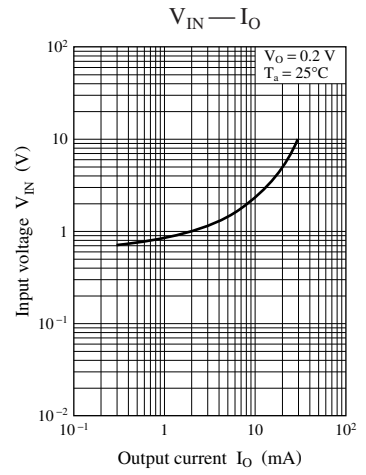
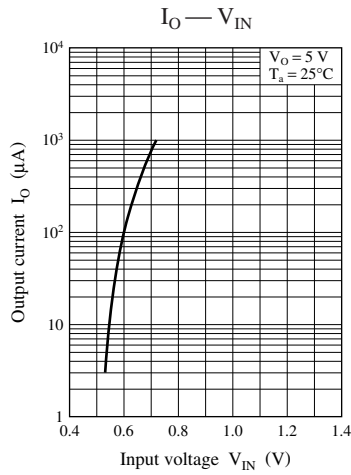
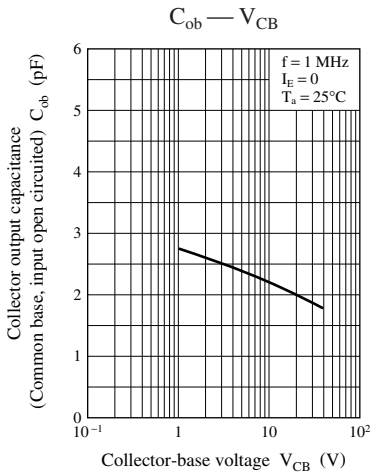
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Common characteristics chart

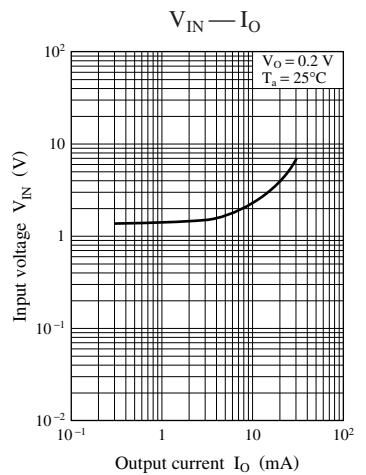
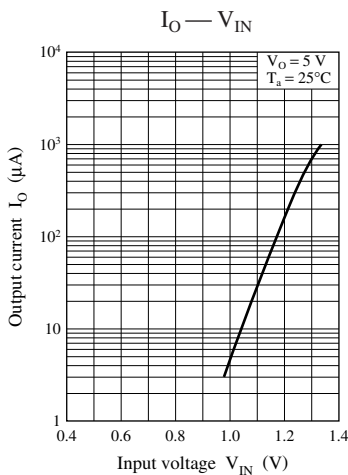
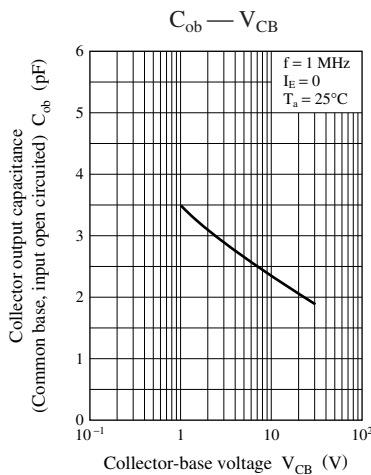
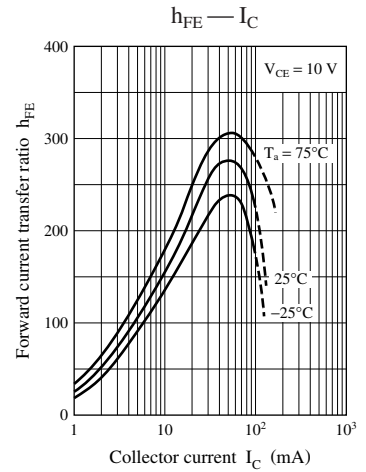
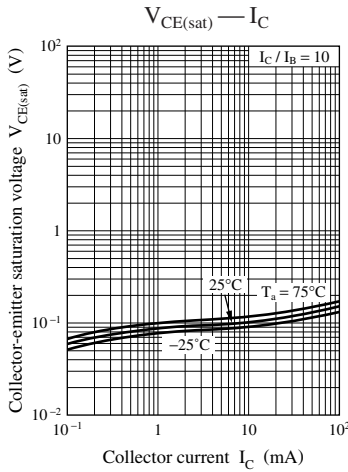
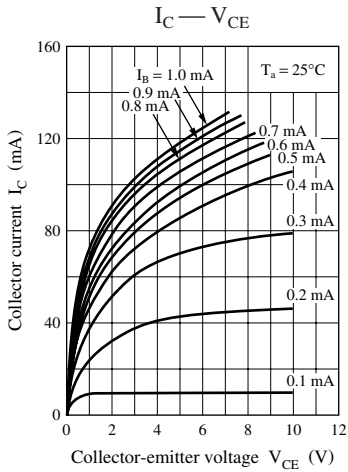


Characteristics charts of UNR9210G

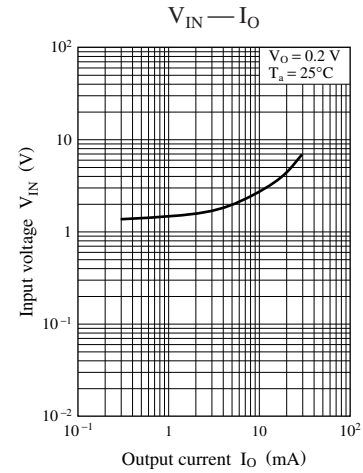
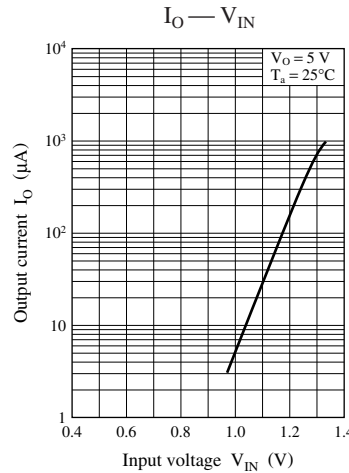
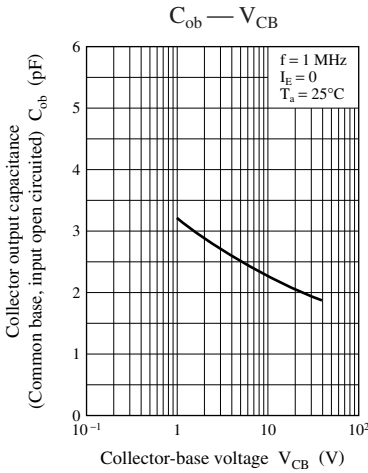
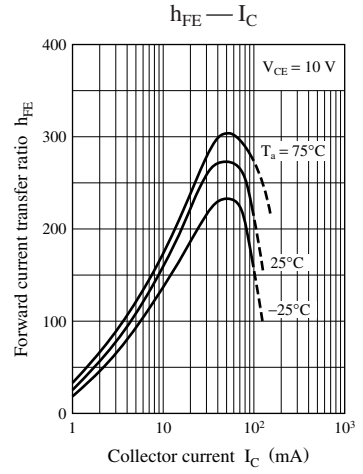
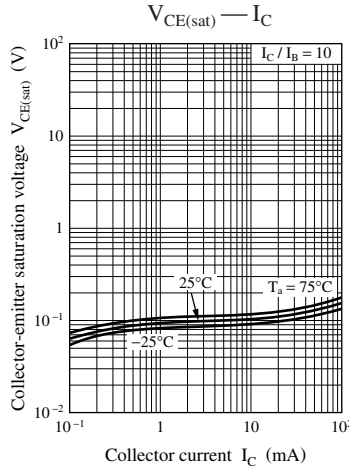
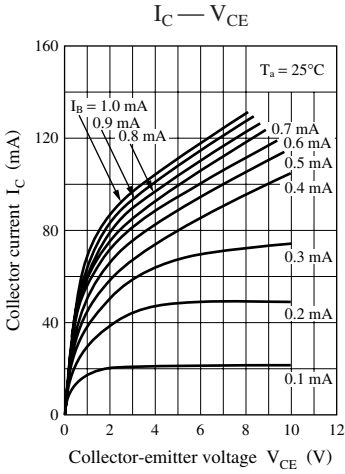




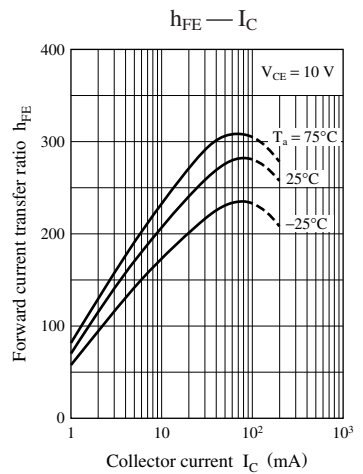
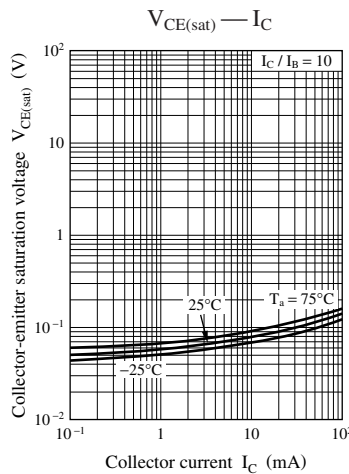
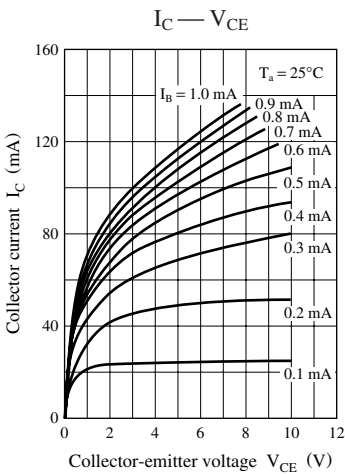
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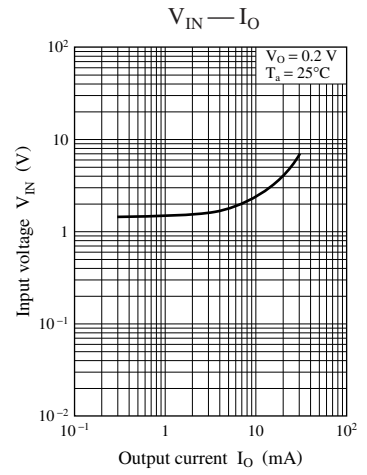
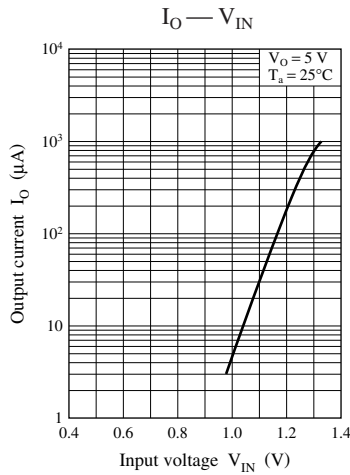
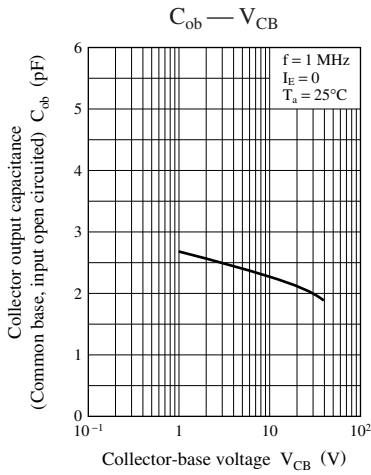


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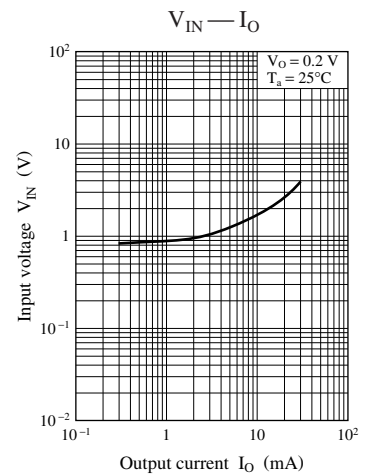
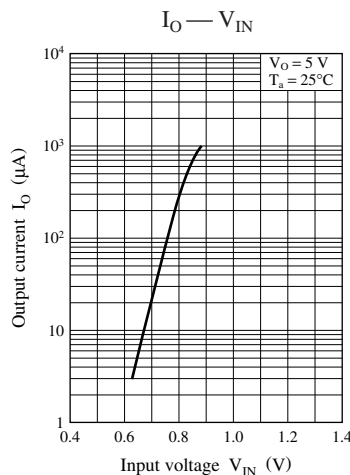
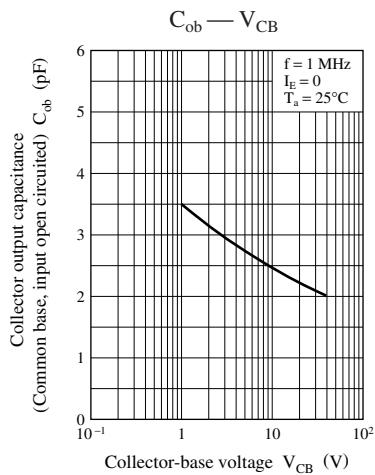
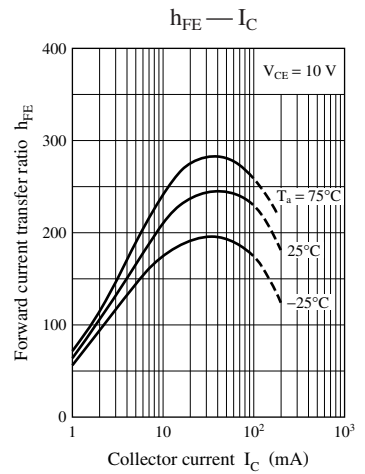
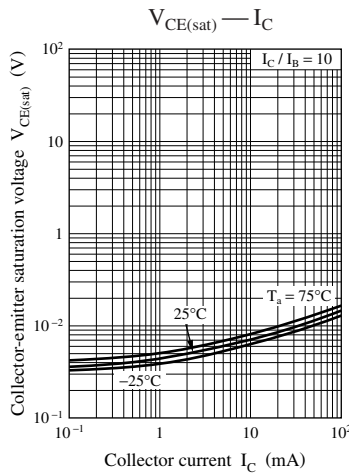
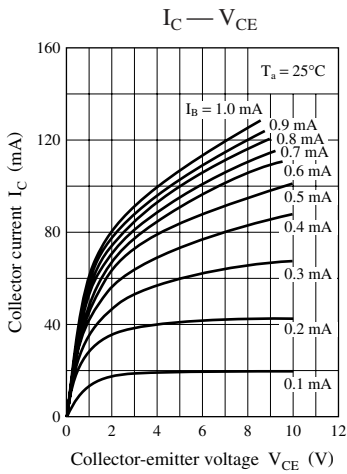


Characteristics charts of UNR9213G

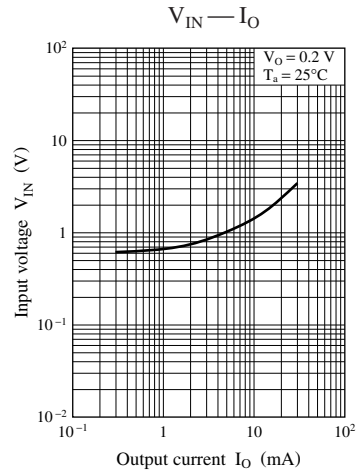
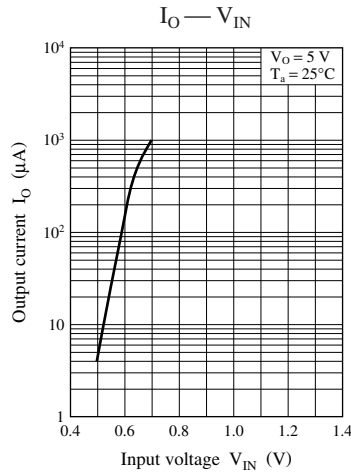
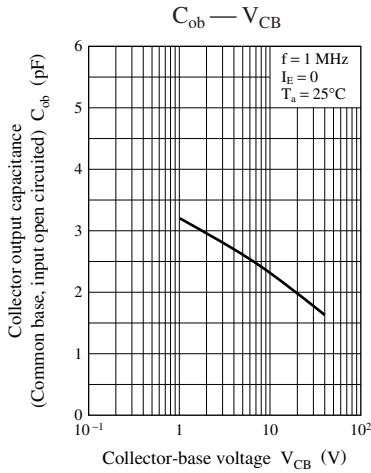
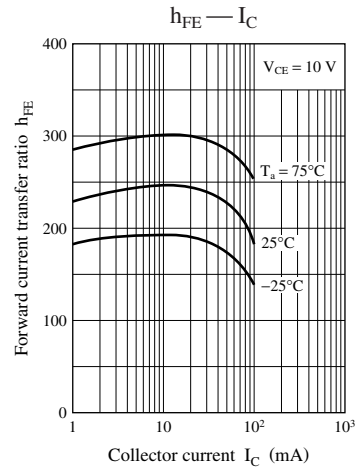
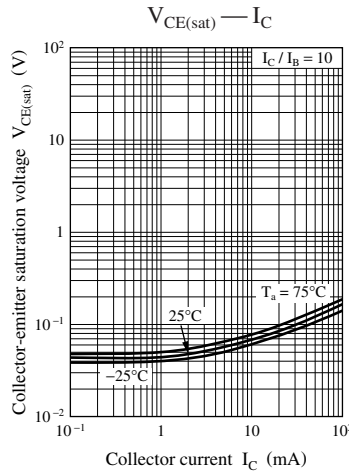
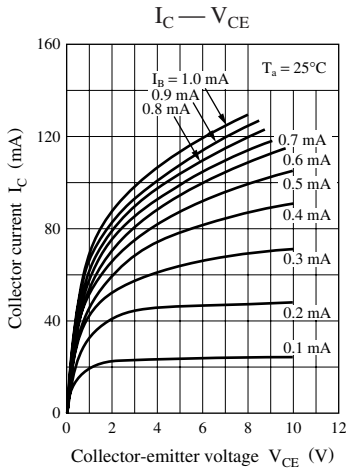




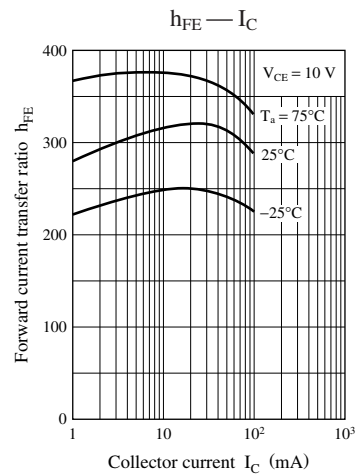
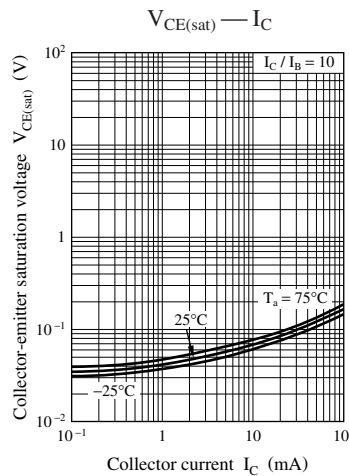
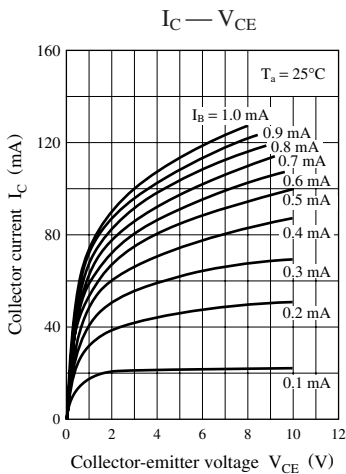
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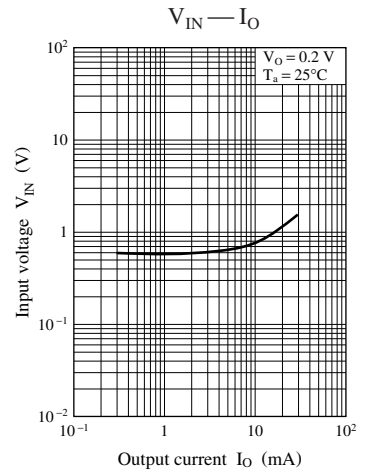
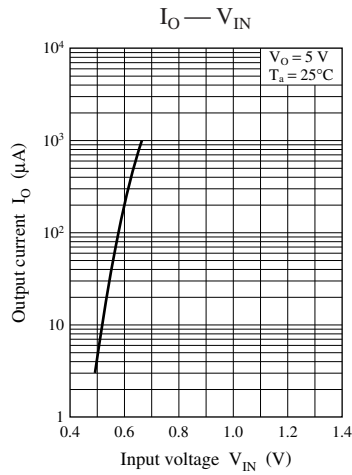
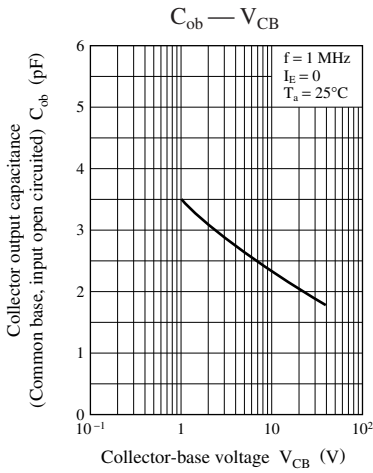


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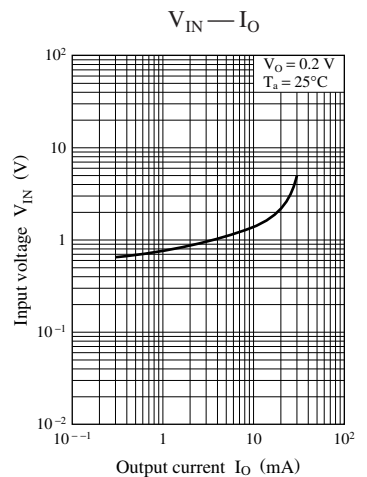
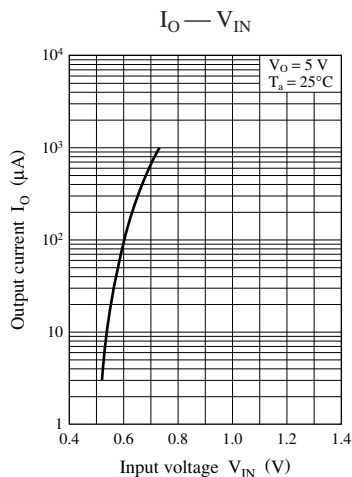
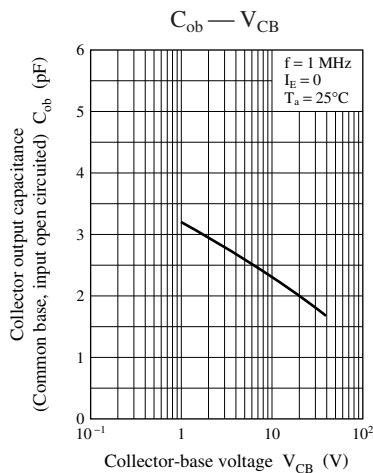
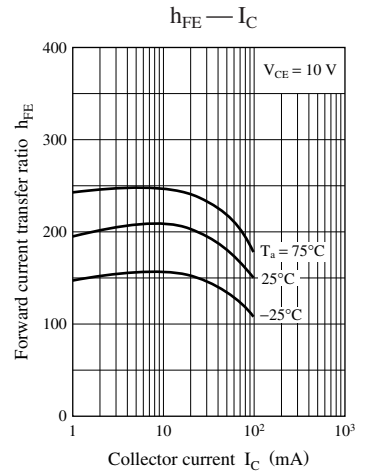
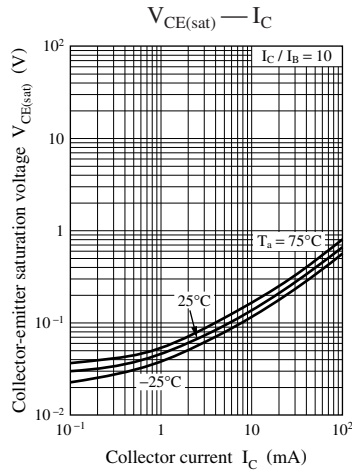
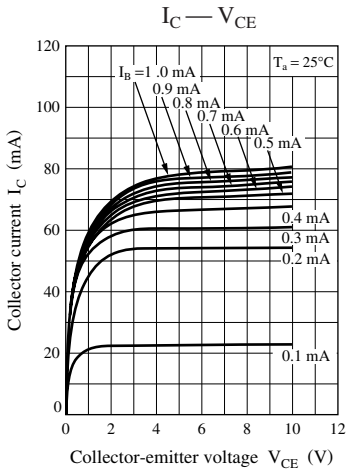


Characteristics charts of UNR9216G



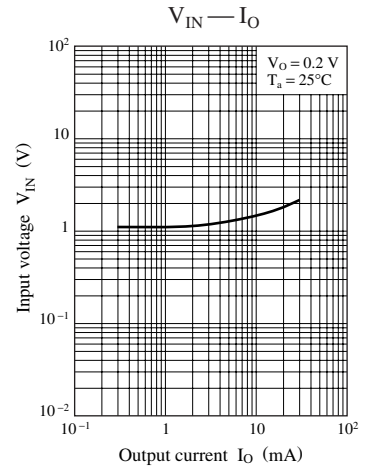
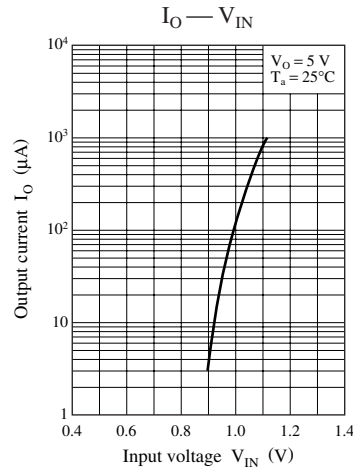
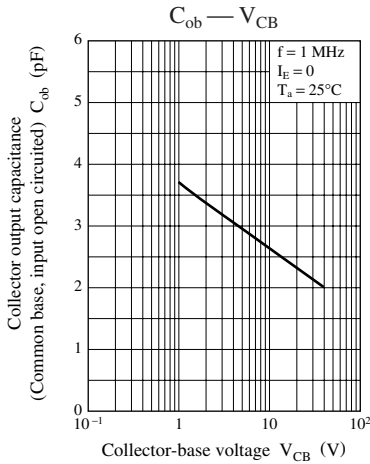
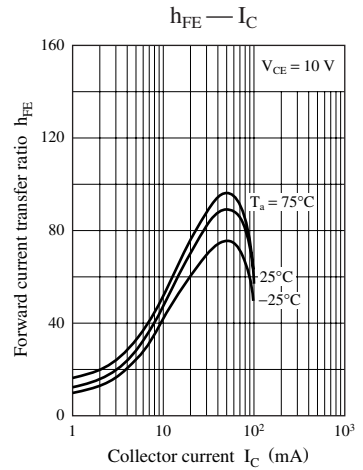
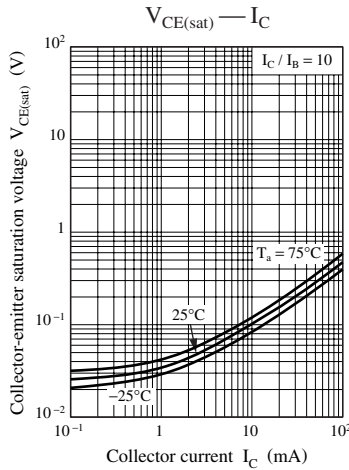
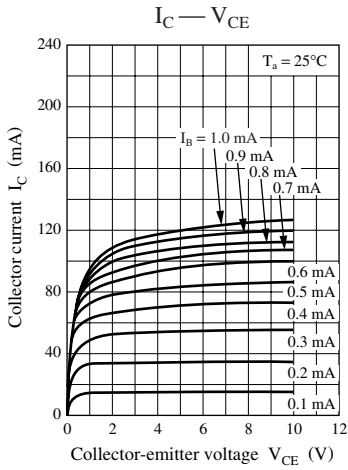


Characteristics charts of UNR9217G

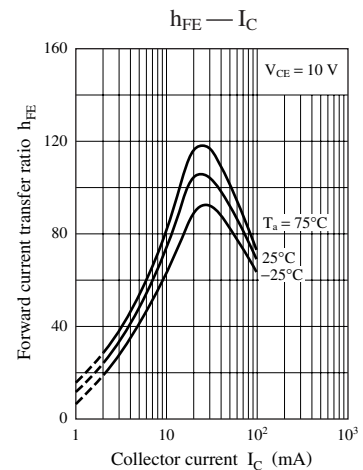
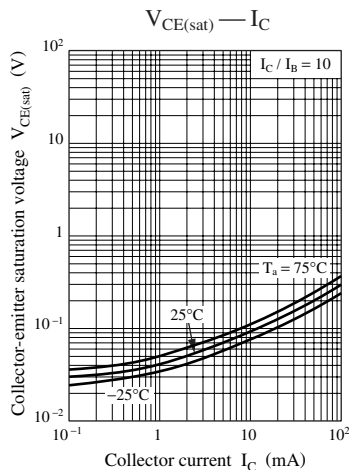
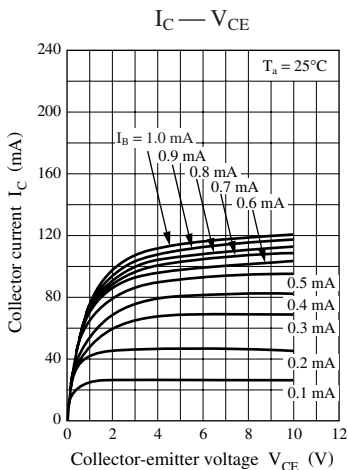


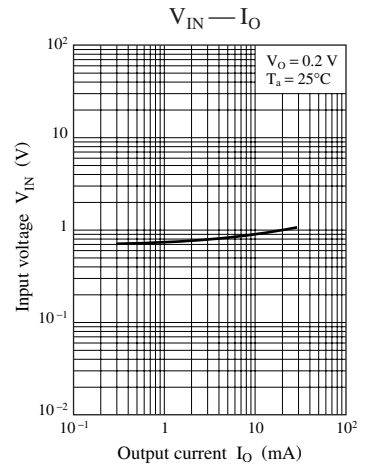
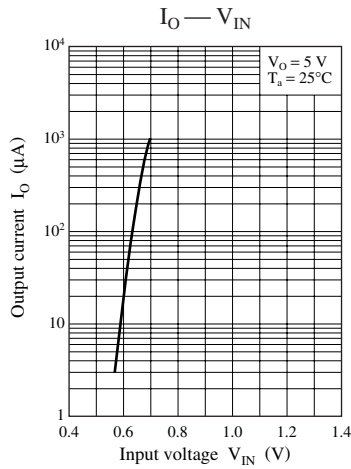
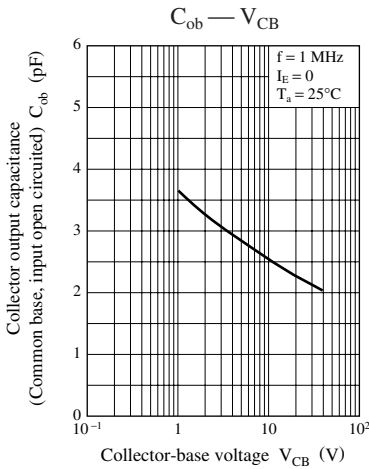


Characteristics charts of UNR9218G

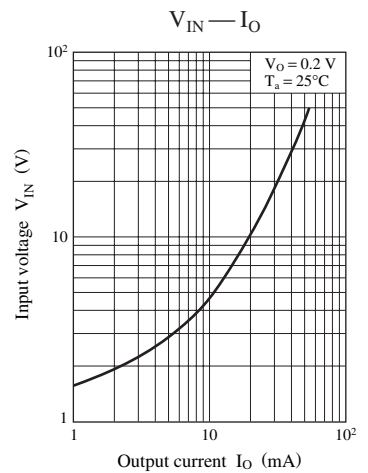
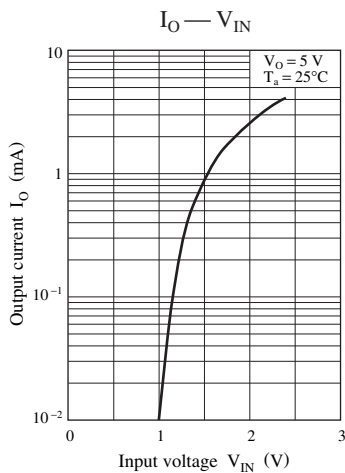
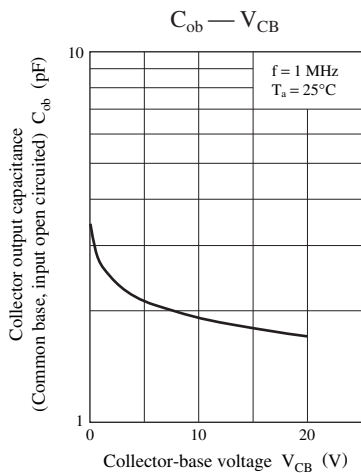
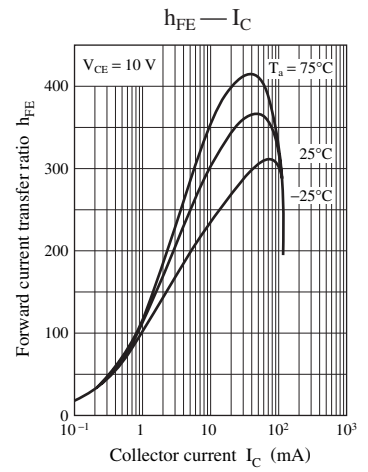
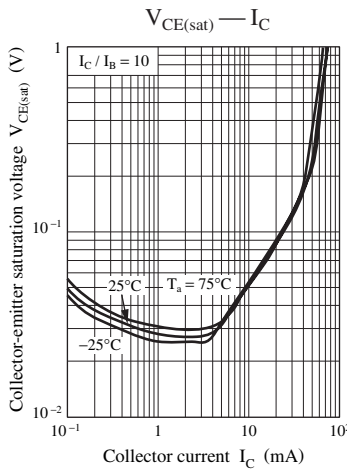
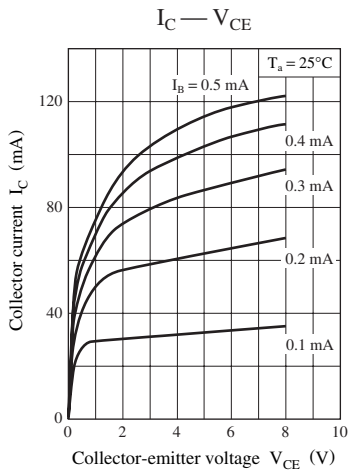


Characteristics charts of UNR9219G

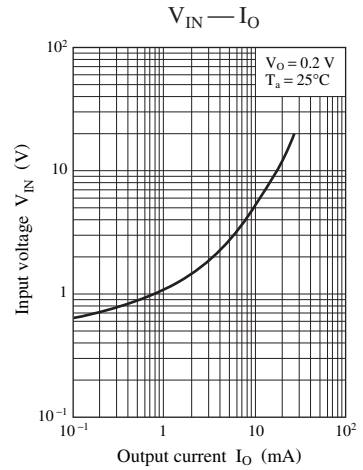
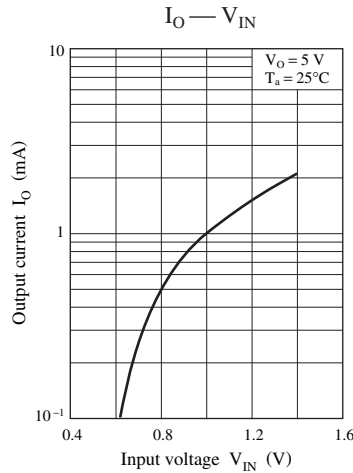
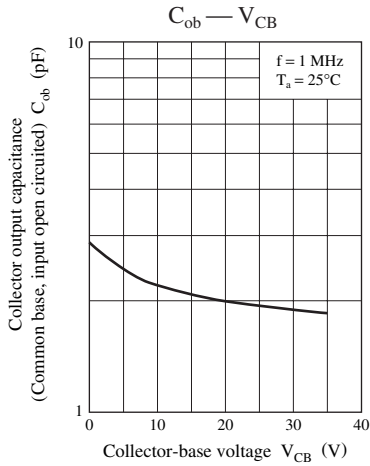
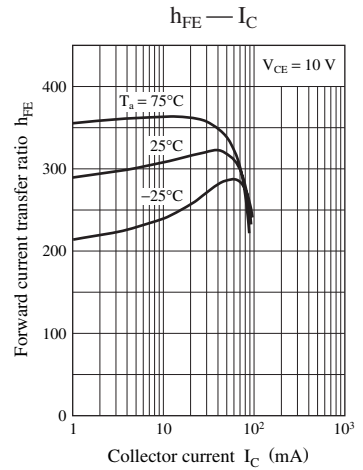
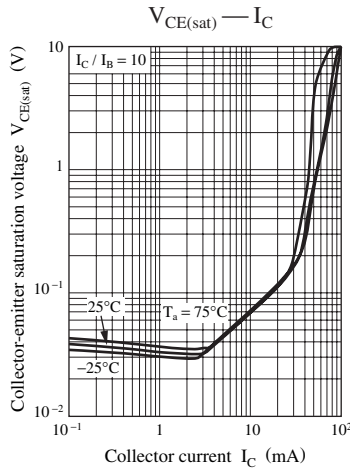
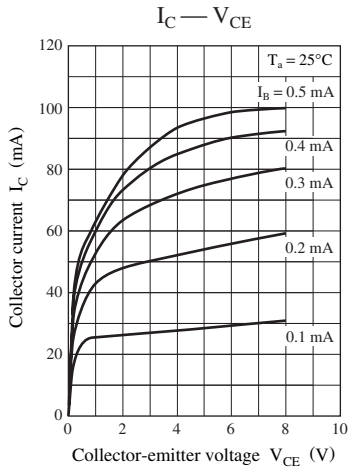




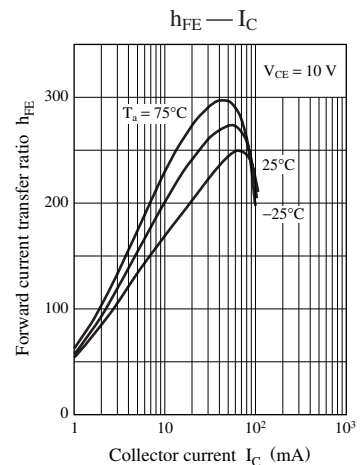
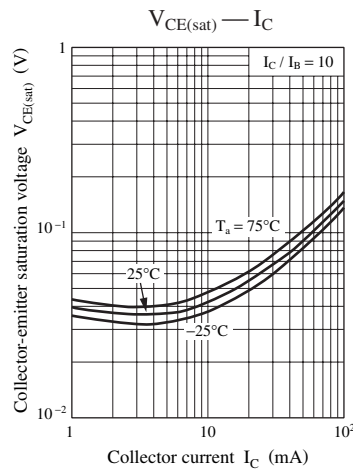
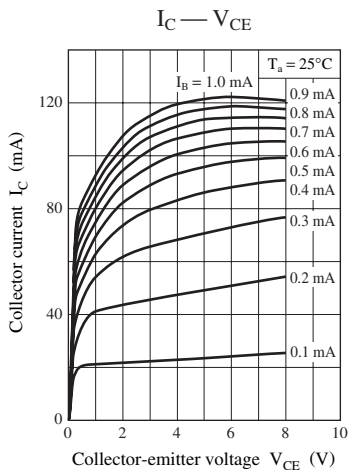
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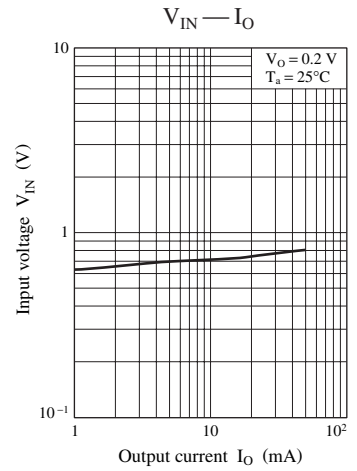
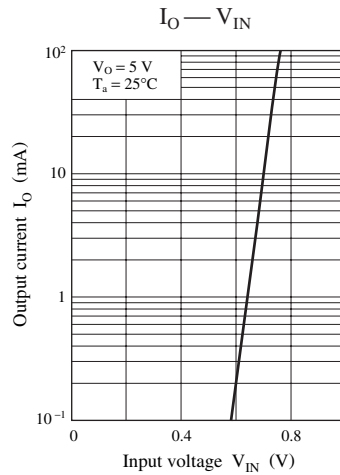
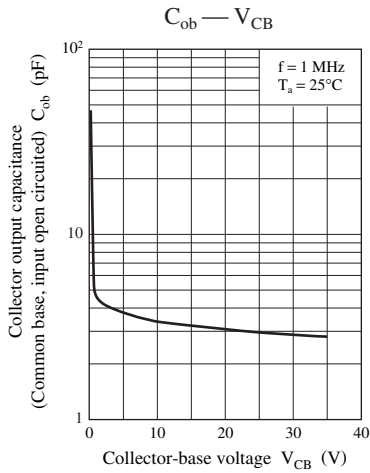


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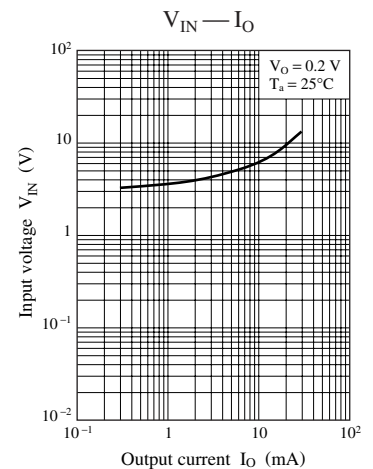
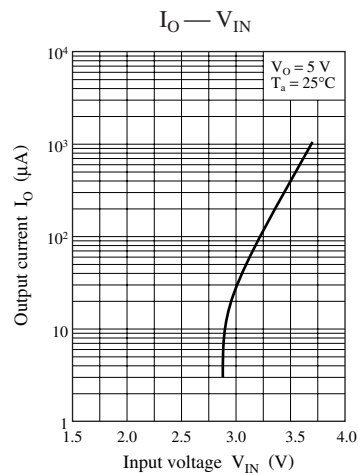
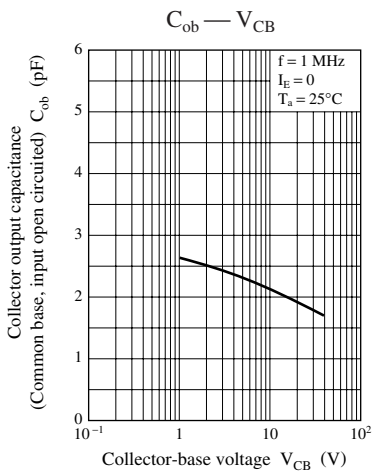
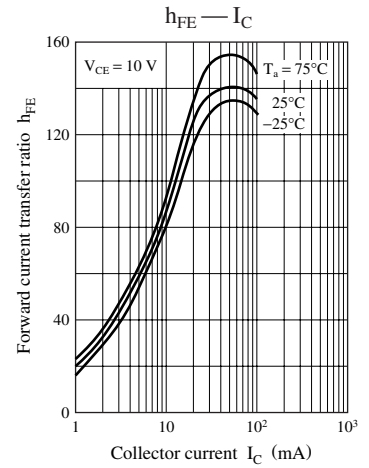
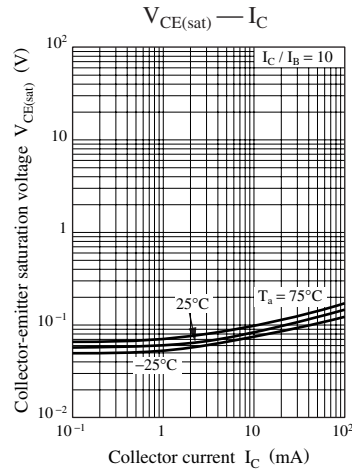
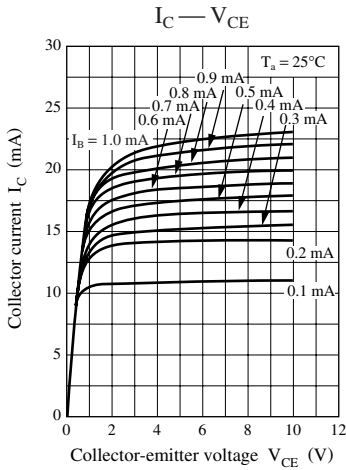


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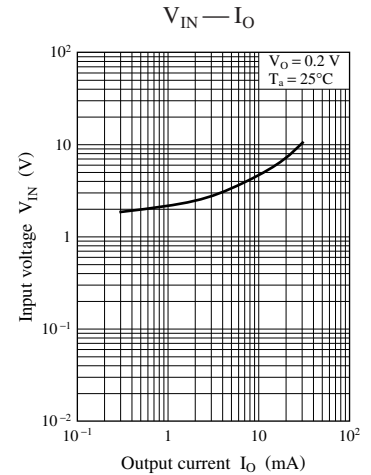
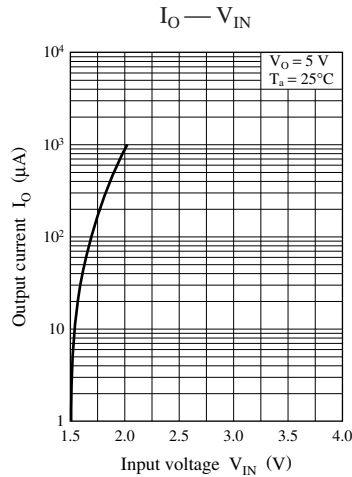
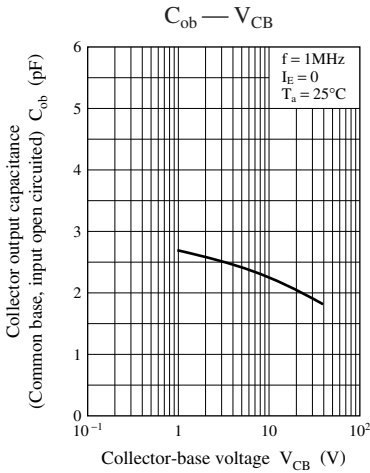
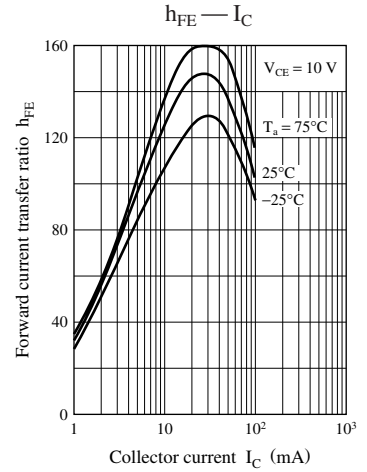
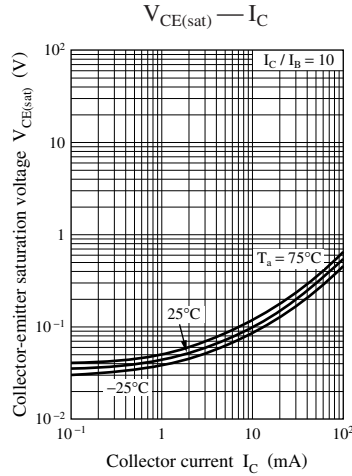
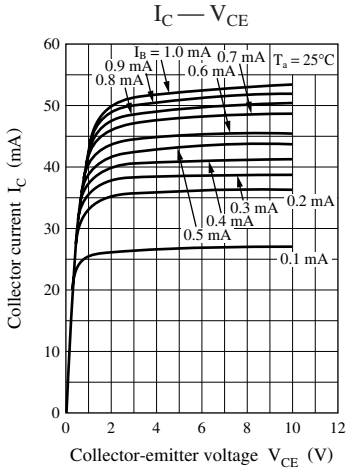




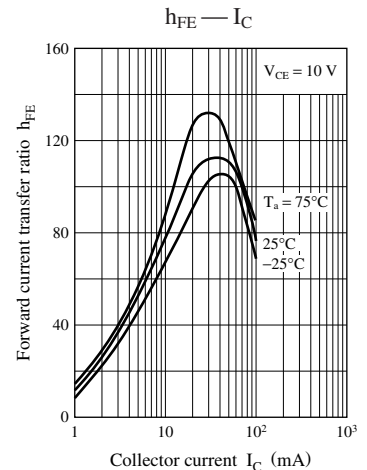
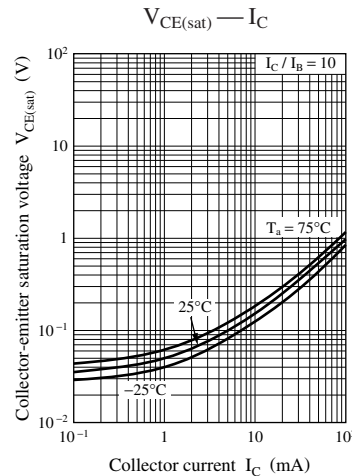
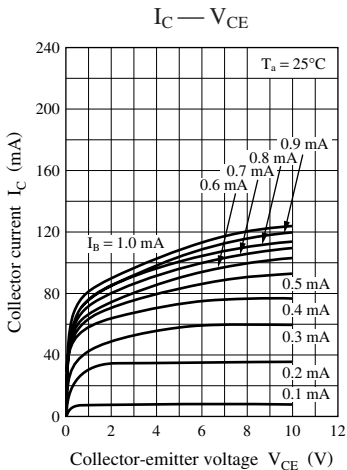
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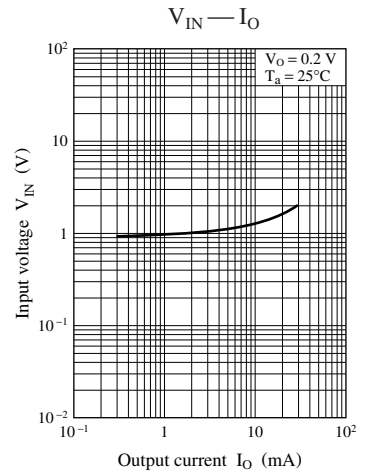
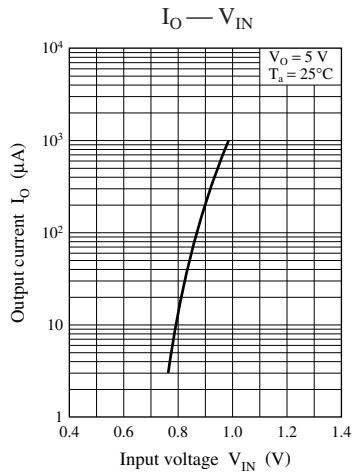
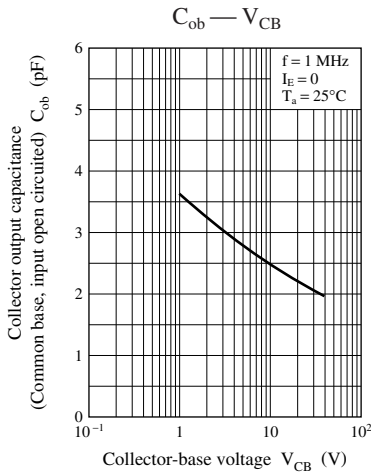


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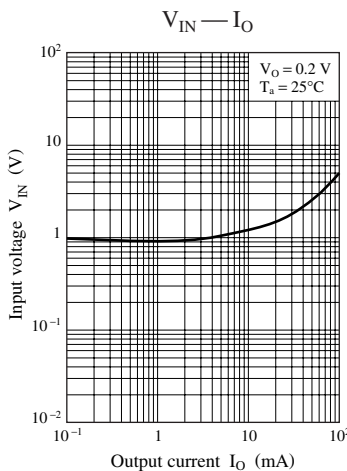
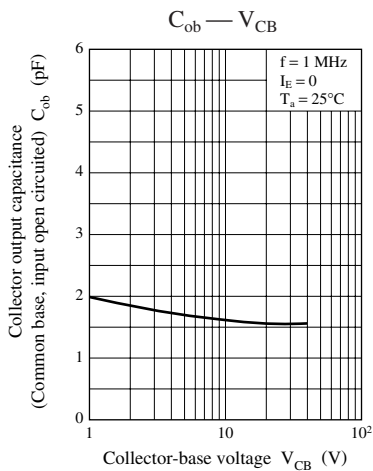
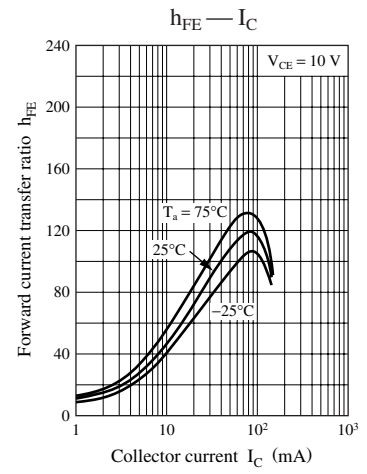
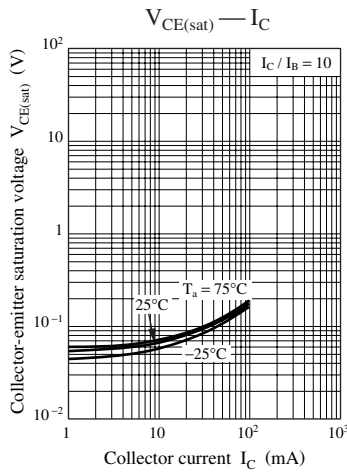
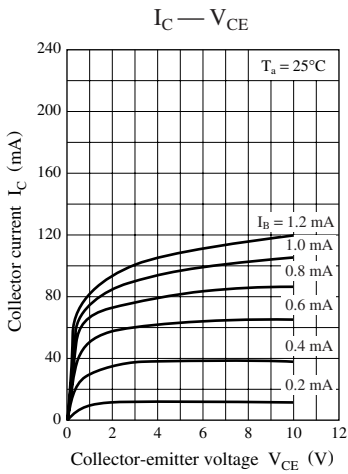


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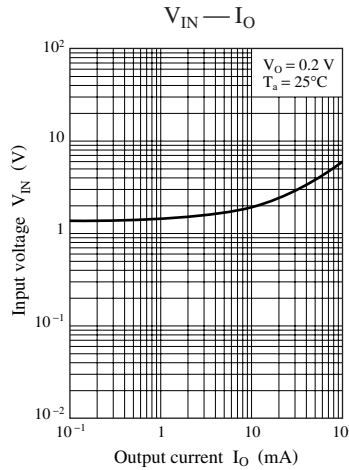
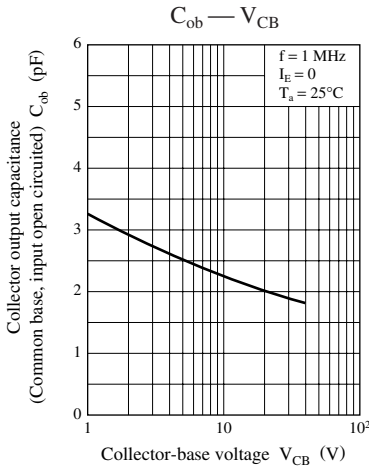
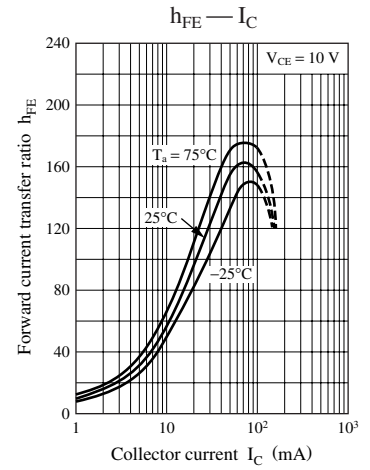
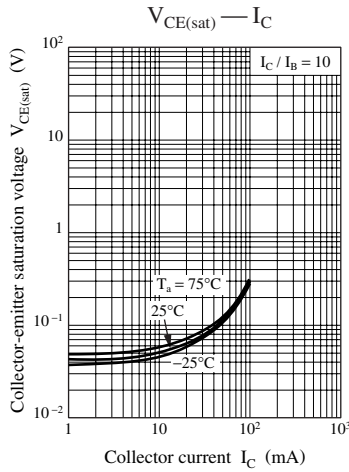
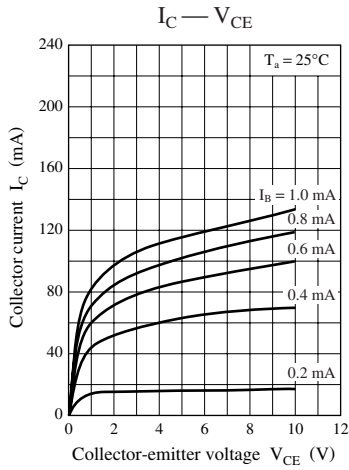




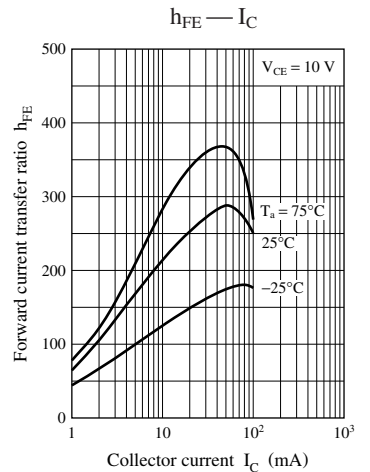
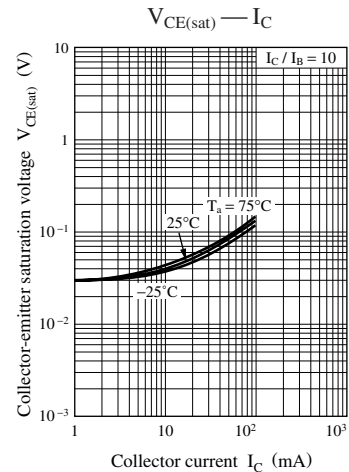
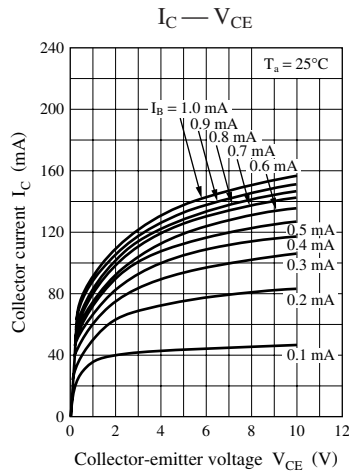
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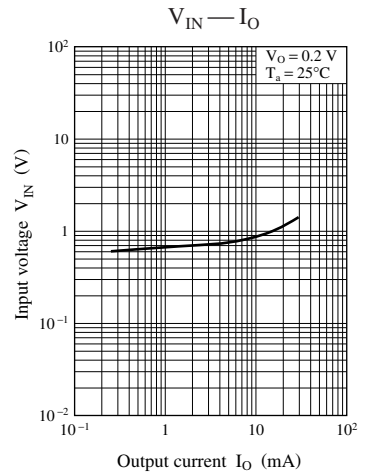
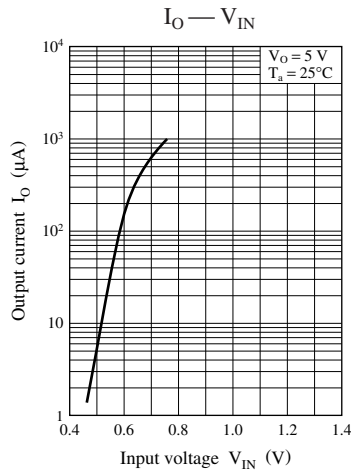
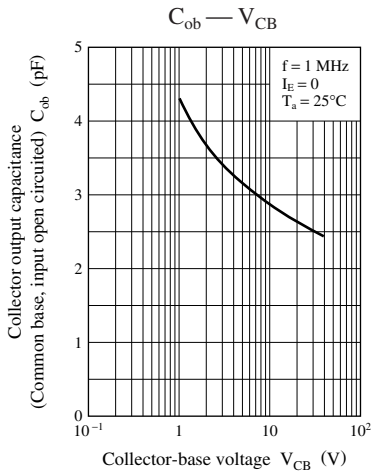


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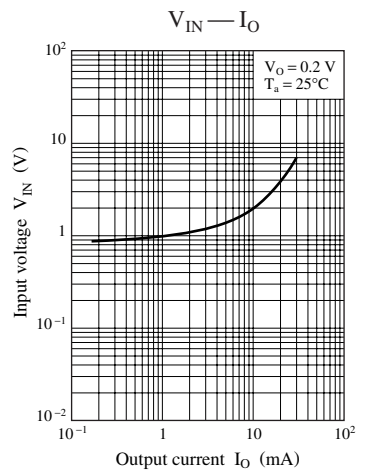
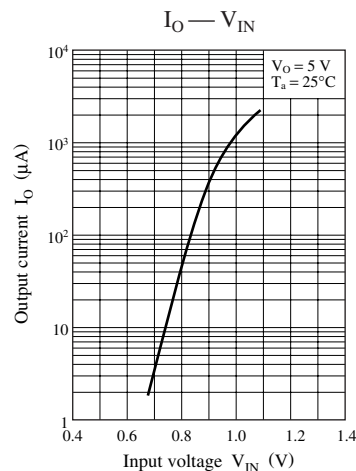
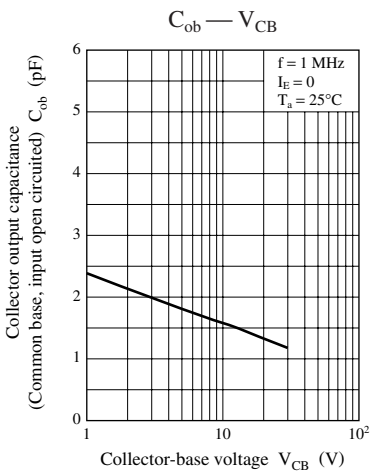
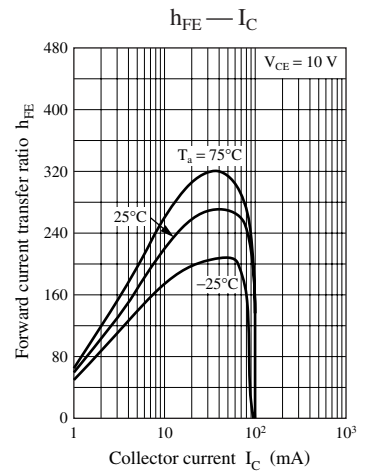
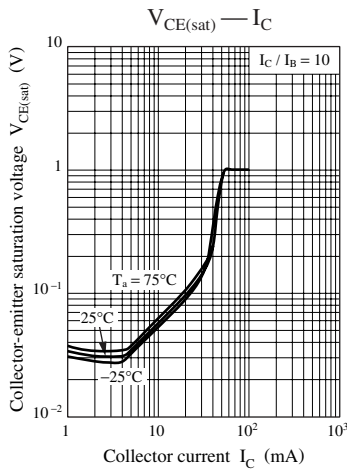
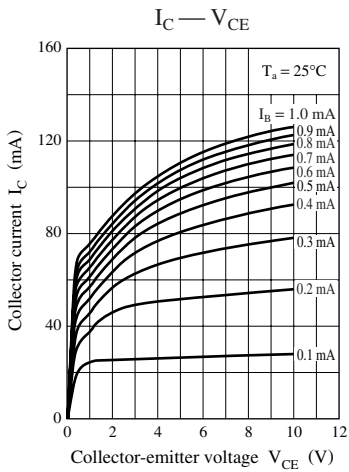


Characteristics charts of UNR921MG



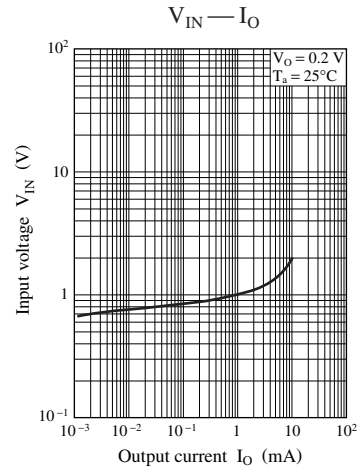
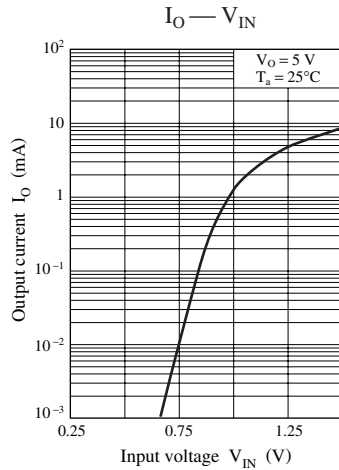
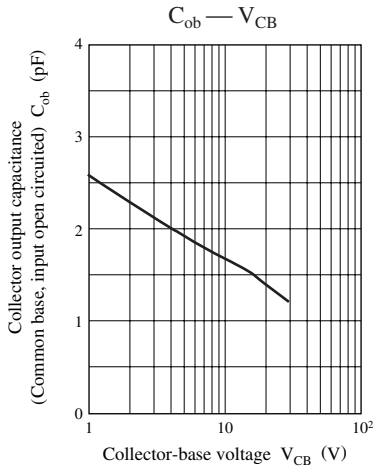
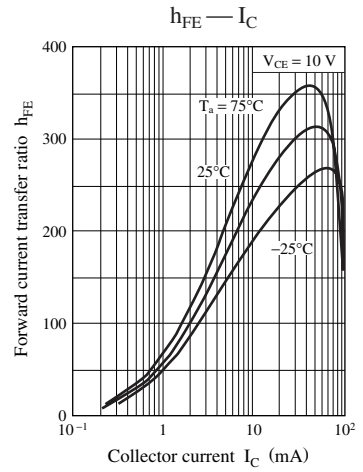
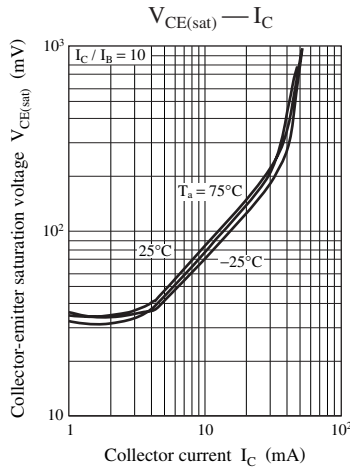
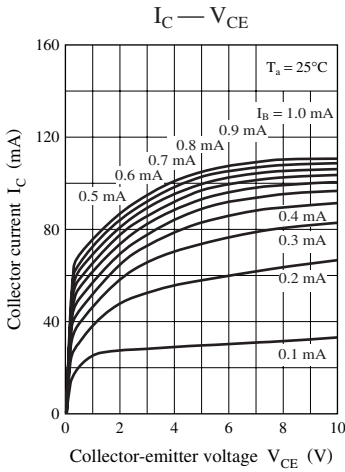


Characteristics charts of UNR921NG

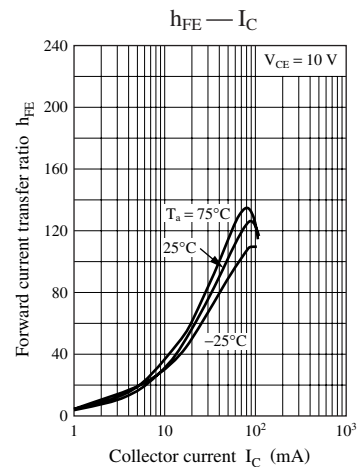
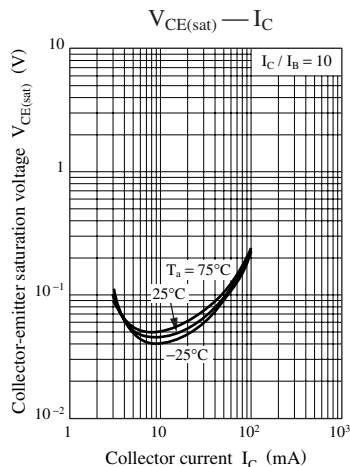
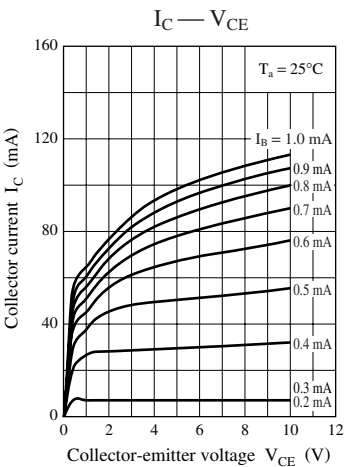


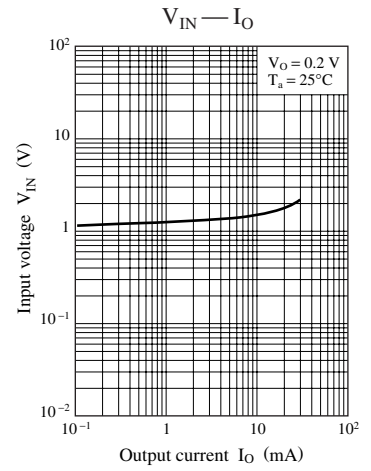
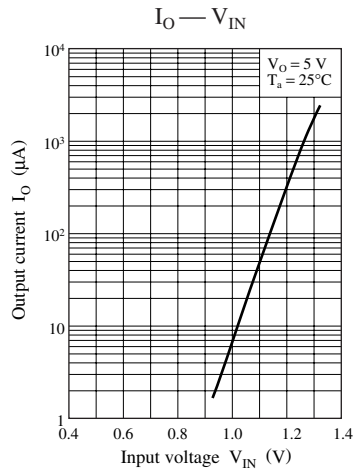
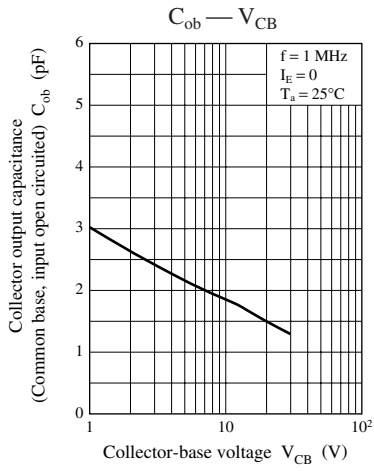


Characteristics charts of UNR921TG



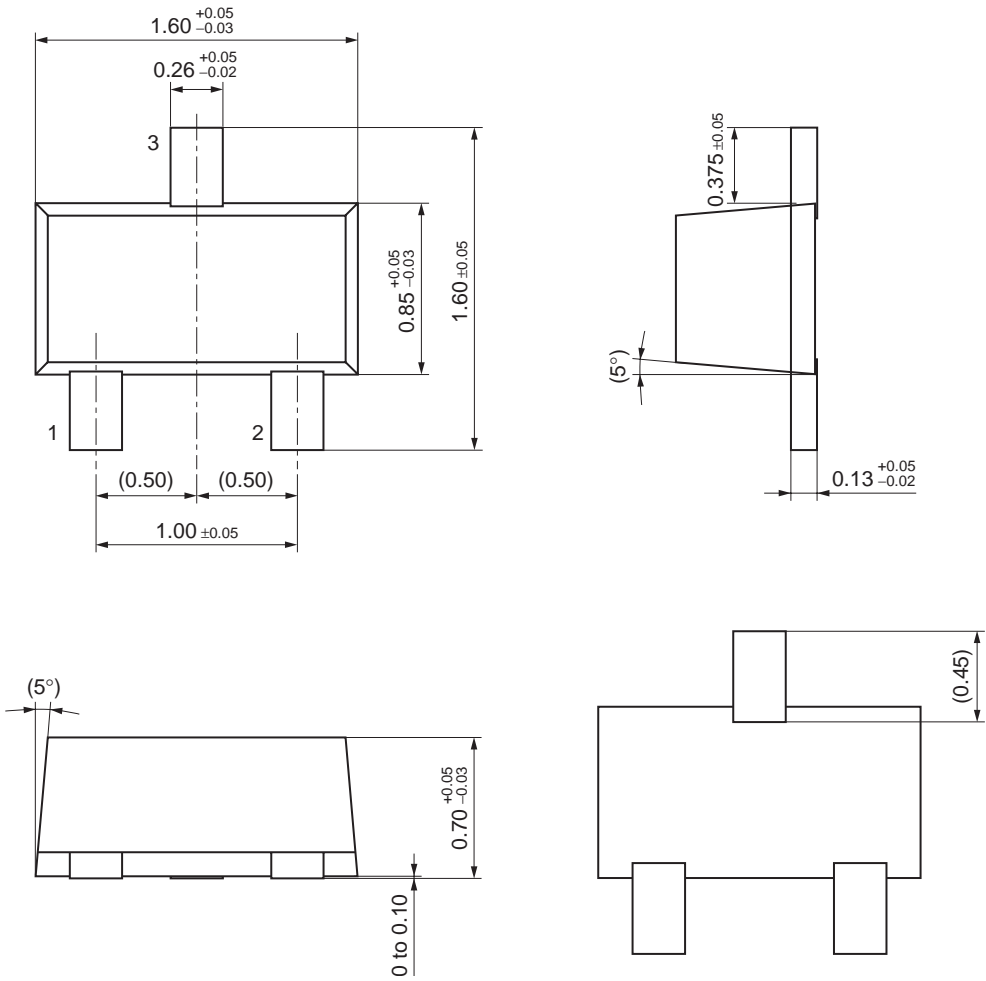
Characteristics charts of UNR921VG





# SSMini3-F3

Unit: mm



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