

# UNR521xG 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
- S-Mini type package, allowing automatic insertion through the tape packing and magazine packing

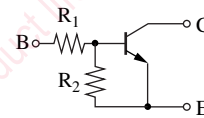
### ■ Resistance by Part Number

	Marking symbol	(R <sub>1</sub> )	(R <sub>2</sub> )
• UNR5210G	8L	47 kΩ	—
• UNR5211G	8A	10 kΩ	10 kΩ
• UNR5212G	8B	22 kΩ	22 kΩ
• UNR5213G	8C	47 kΩ	47 kΩ
• UNR5214G	8D	10 kΩ	47 kΩ
• UNR5215G	8E	10 kΩ	—
• UNR5216G	8F	4.7 kΩ	—
• UNR5217G	8H	22 kΩ	—
• UNR5218G	8I	0.51 kΩ	5.1 kΩ
• UNR5219G	8K	1 kΩ	10 kΩ
• UNR521DG	8M	47 kΩ	10 kΩ
• UNR521EG	8N	47 kΩ	22 kΩ
• UNR521FG	8O	4.7 kΩ	10 kΩ
• UNR521KG	8P	10 kΩ	4.7 kΩ
• UNR521LG	8Q	4.7 kΩ	4.7 kΩ
• UNR521MG	EL	2.2 kΩ	47 kΩ
• UNR521NG	EX	4.7 kΩ	47 kΩ
• UNR521TG	EZ	22 kΩ	47 kΩ
• UNR521VG	FD	2.2 kΩ	2.2 kΩ
• UNR521ZG	FF	4.7 kΩ	22 kΩ

### ■ Package

- Code  
SMini3-F2
- 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>	150	mW
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°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 cutoff current (Emitter open)		$I_{CBO}$	$V_{CB} = 50 \text{ V}, I_E = 0$			0.1	$\mu\text{A}$
Collector-emitter cutoff current (Base open)		$I_{CEO}$	$V_{CE} = 50 \text{ V}, I_B = 0$			0.5	
Emitter-base cutoff current (Collector open)	UNR5210G/5215G/5216G/5217G	$I_{EBO}$	$V_{EB} = 6 \text{ V}, I_C = 0$			0.01	mA
	UNR5213G					0.1	
	UNR5212G/5214G/521DG/ 521EG/521MG/521NG/521TG					0.2	
	UNR521ZG					0.4	
	UNR5211G					0.5	
	UNR521FG/521KG					1.0	
	UNR5219G					1.5	
	UNR5218G/521LG/521VG					2.0	
Forward current transfer ratio	UNR521VG	$h_{FE}$	$V_{CE} = 10 \text{ V}, I_C = 5 \text{ mA}$	6		20	—
	UNR5218G/521KG/521LG			20			
	UNR5219G/521DG/521FG			30			
	UNR5211G			35			
	UNR5212G/521EG			60			
	UNR521ZG			60	200		
	UNR5213G/5214G/521MG			80			
	UNR521NG/521TG			80	400		
	UNR5210G*/5215G*/5216G*/5217G*			160	460		
Collector-emitter saturation voltage		$V_{CE(sat)}$	$I_C = 10 \text{ mA}, I_B = 0.3 \text{ mA}$			0.25	V
UNR521VG				$I_C = 10 \text{ mA}, I_B = 1.5 \text{ mA}$			
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
UNR5213G/521KG			$V_{CC} = 5 \text{ V}, V_B = 3.5 \text{ V}, R_L = 1 \text{ k}\Omega$				
UNR521DG			$V_{CC} = 5 \text{ V}, V_B = 10 \text{ V}, R_L = 1 \text{ k}\Omega$				
UNR521EG			$V_{CC} = 5 \text{ V}, V_B = 6.0 \text{ V}, R_L = 1 \text{ k}\Omega$				
Transition frequency		$f_T$	$V_{CB} = 10 \text{ V}, I_E = -2 \text{ mA}, f = 200 \text{ MHz}$		150		MHz
Input resistance	UNR5218G	$R_1$		-30%	0.51	+30%	k $\Omega$
	UNR5219G				1.0		
	UNR521MG/521VG				2.2		
	UNR5216G/521FG/521LG/ 521NG/521ZG				4.7		
	UNR5211G/5214G/5215G/521KG				10		
	UNR5212G/5217G/521TG				22		
	UNR5210G/5213G/521DG/521EG				47		

Note) 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

2. \*: Rank classification

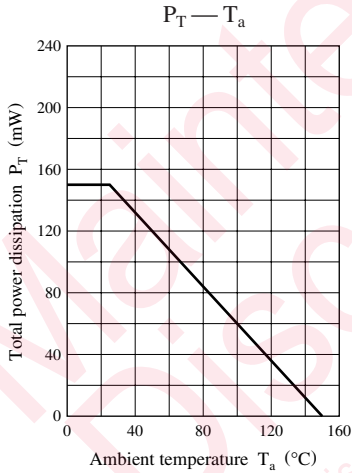
Rank	Q	R	S	No-rank
$h_{FE}$	160 to 260	210 to 340	290 to 460	160 to 460

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

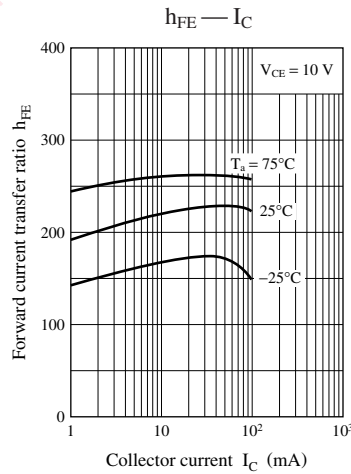
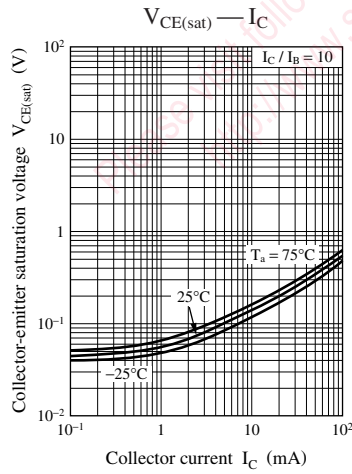
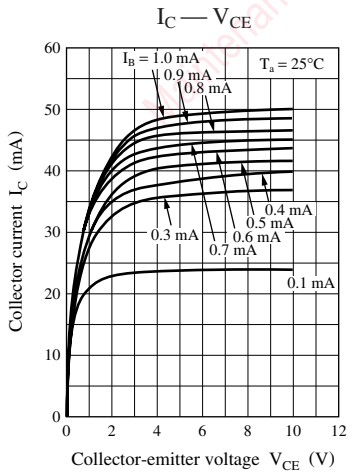
	Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Resistance ratio	UNR521MG	$R_1/R_2$			0.047		—
	UNR521NG				0.1		
	UNR5218G/5219G			0.08	0.10	0.12	
	UNR521ZG				0.21		
	UNR5214G			0.17	0.21	0.25	
	UNR521TG				0.47		
	UNR521FG			0.37	0.47	0.57	
	UNR521VG				1.0		
	UNR5211G/5212G/5213G/5211LG			0.8	1.0	1.2	
	UNR521KG			1.70	2.13	2.60	
	UNR521EG			1.70	2.14	2.60	
	UNR521DG			3.7	4.7	5.7	

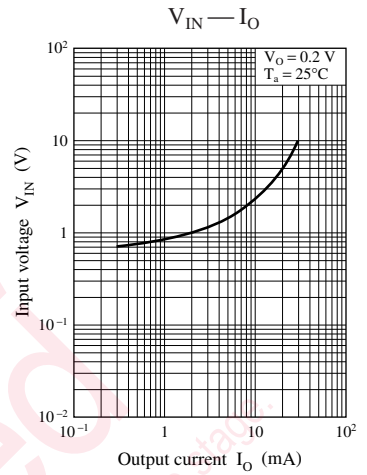
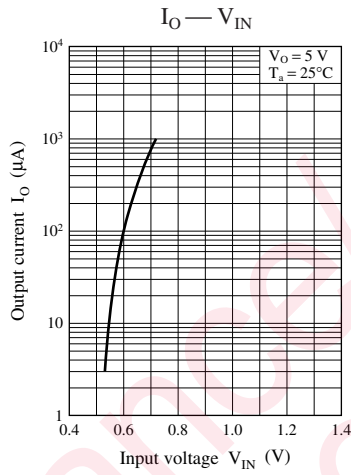
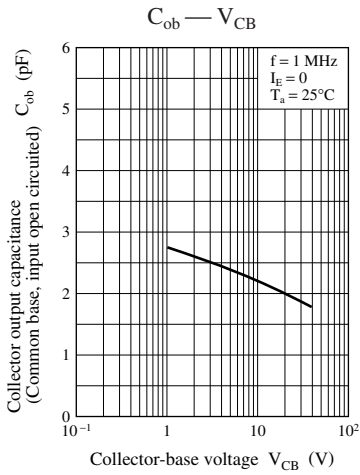
Note) Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

Common characteristics chart

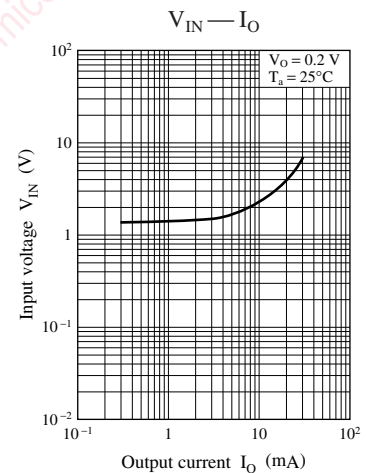
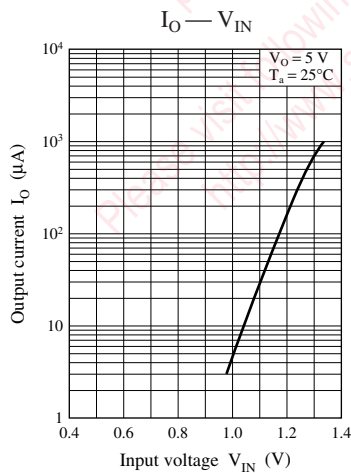
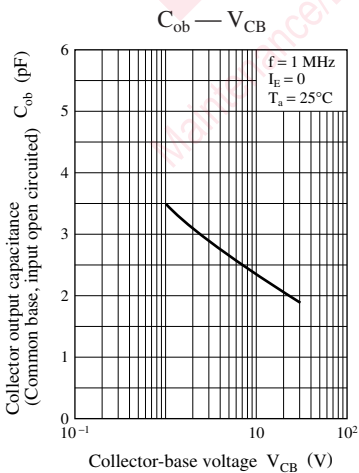
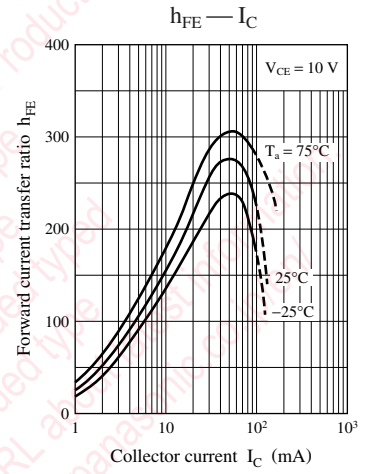
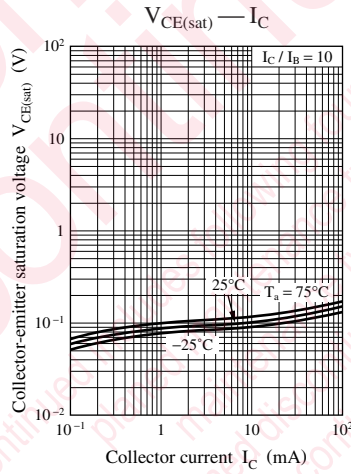
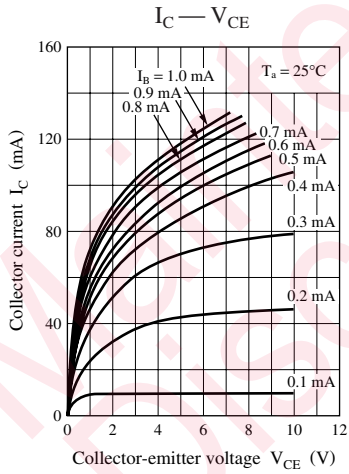


Characteristics charts of UNR5210G

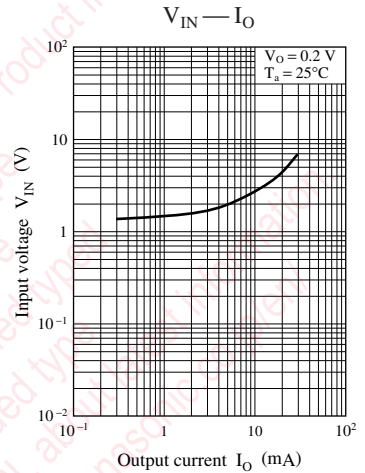
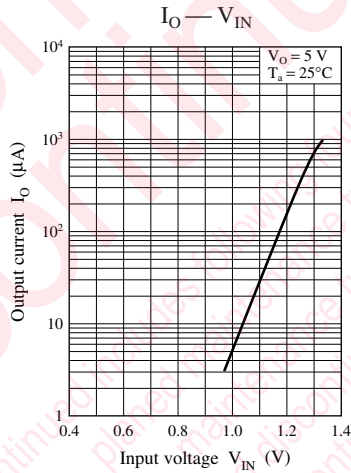
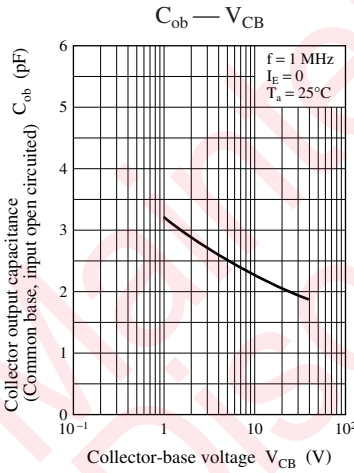
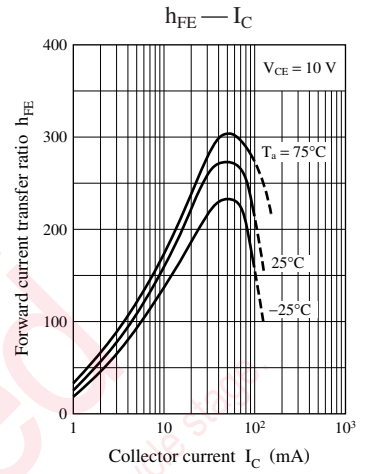
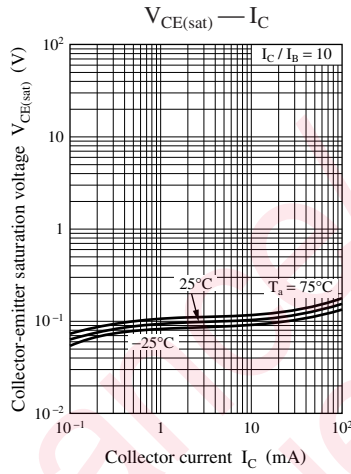
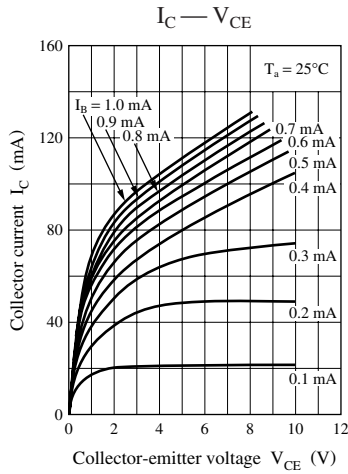




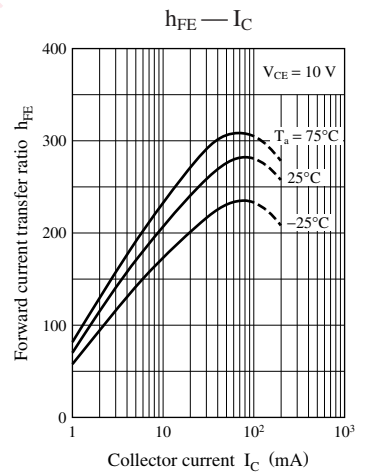
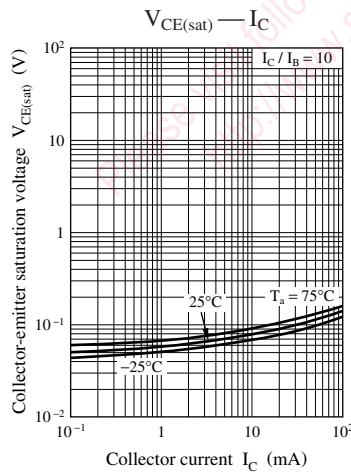
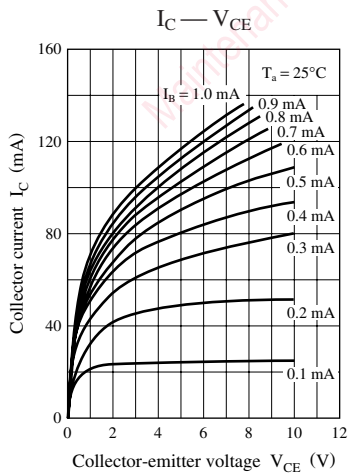
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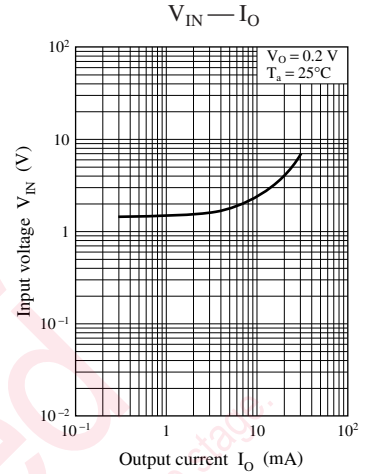
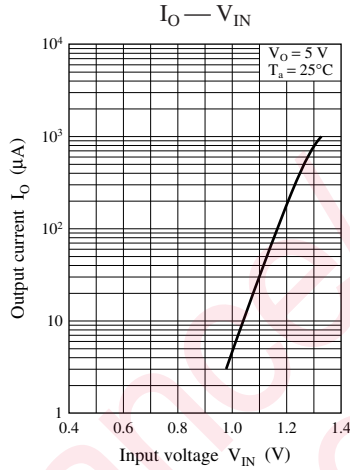
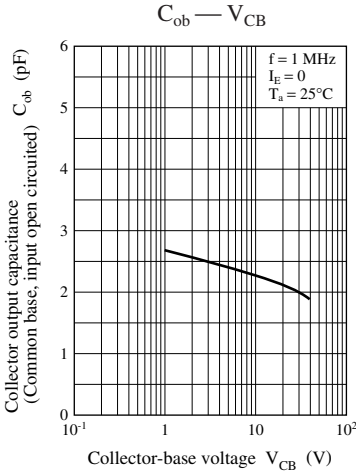


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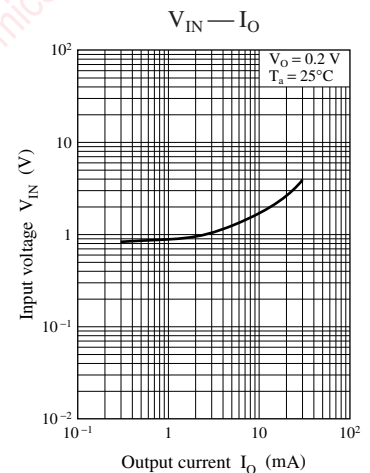
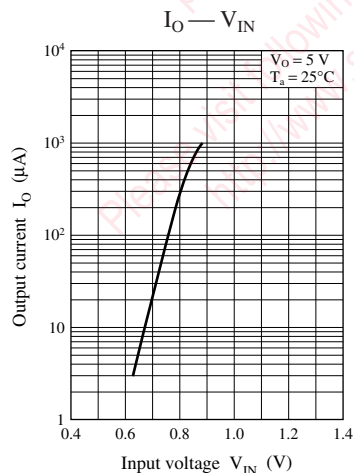
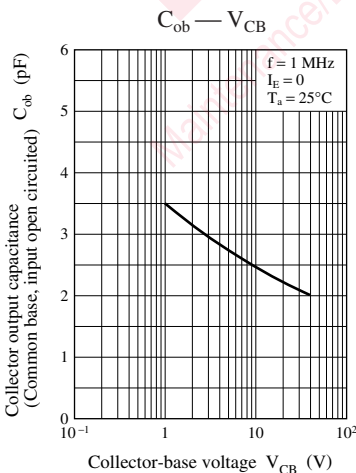
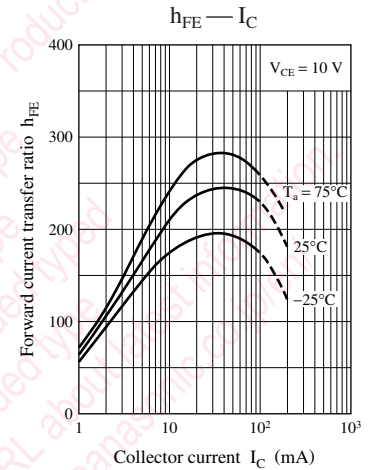
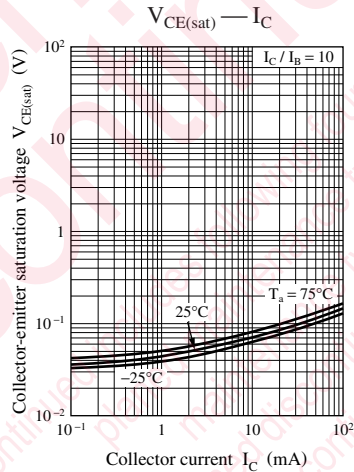
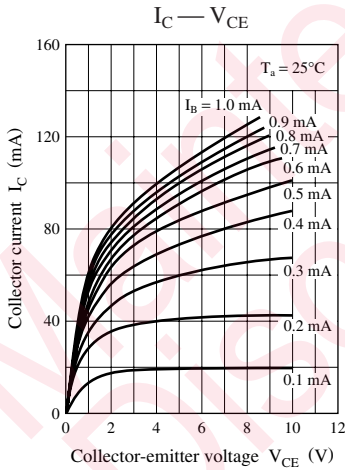


**Characteristics charts of UNR5213G**

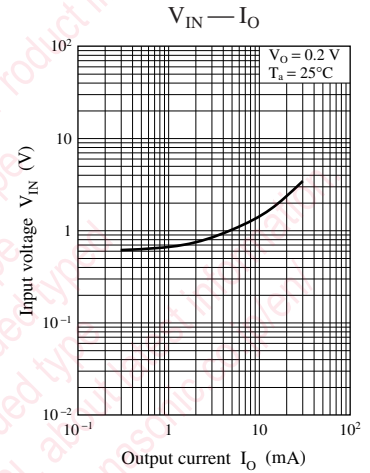
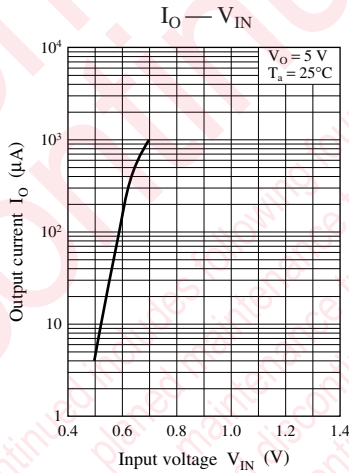
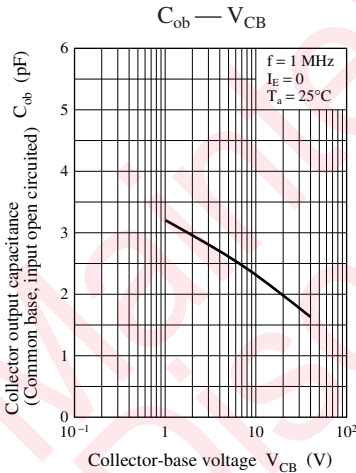
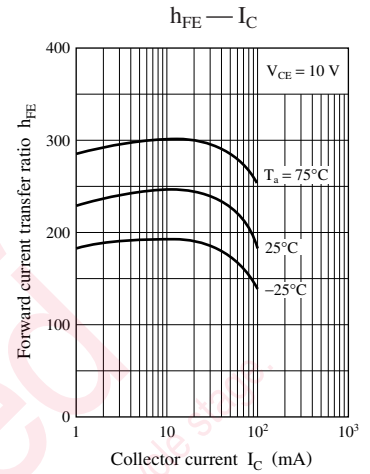
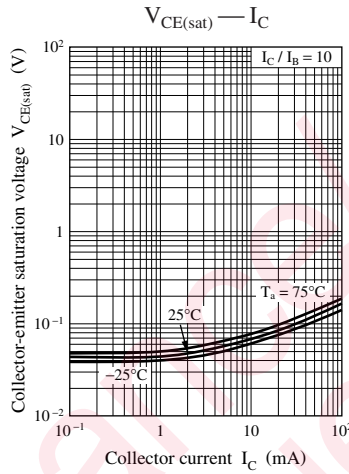
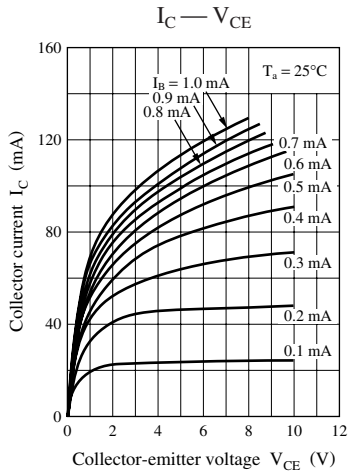




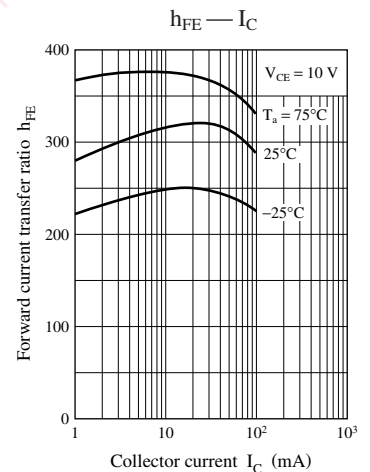
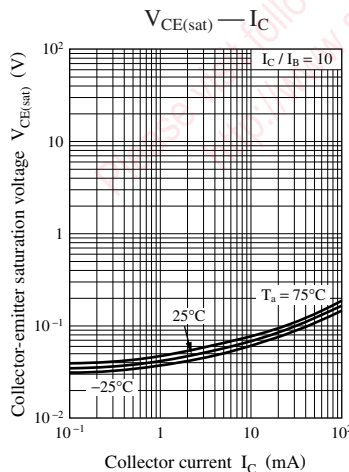
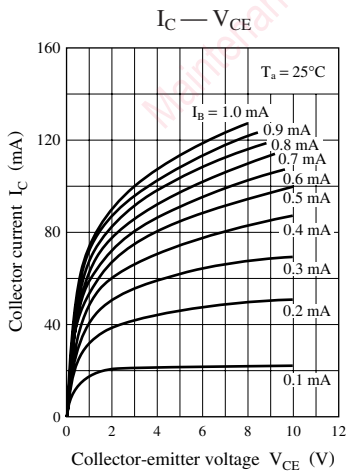
Characteristics charts of UNR5214G

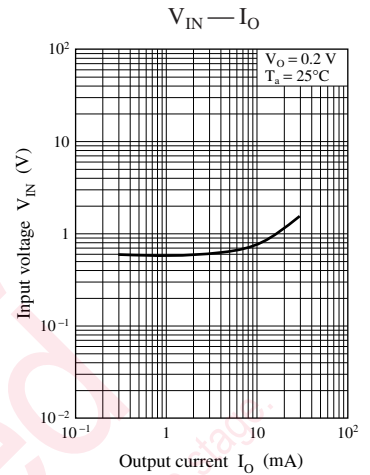
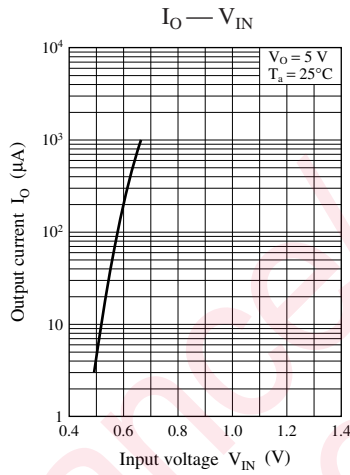
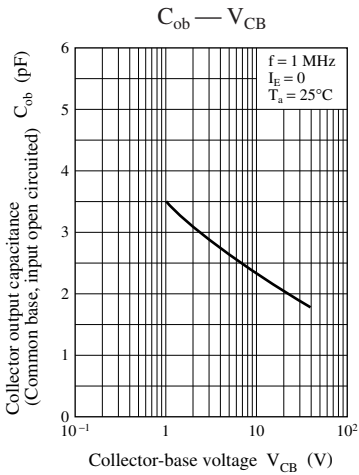


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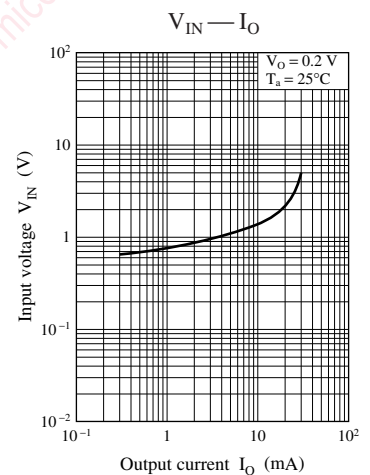
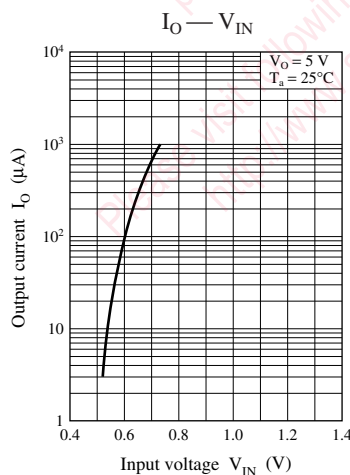
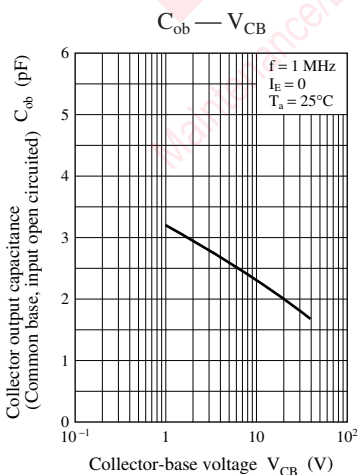
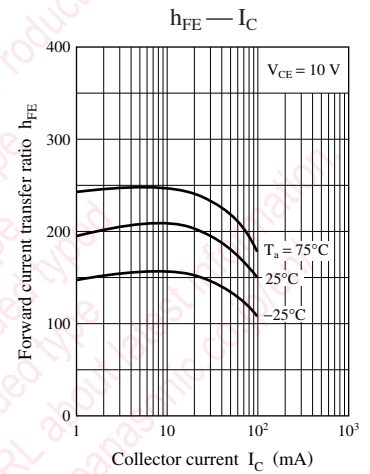
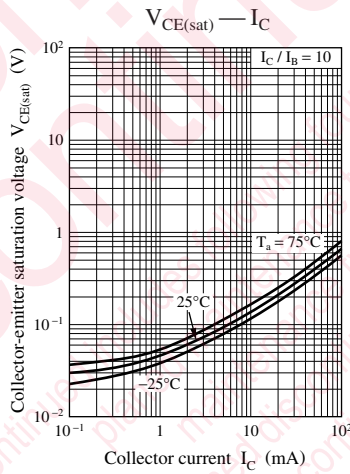
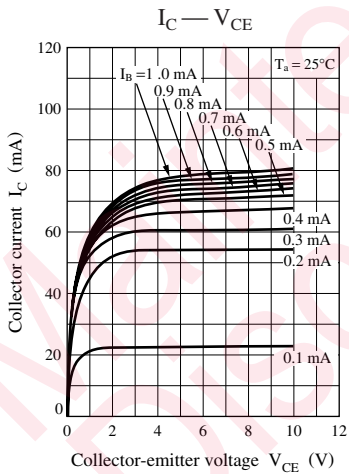


**Characteristics charts of UNR5216G**



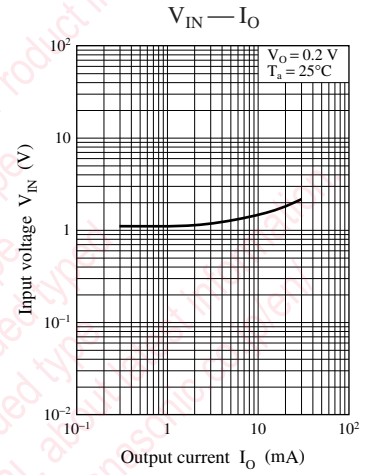
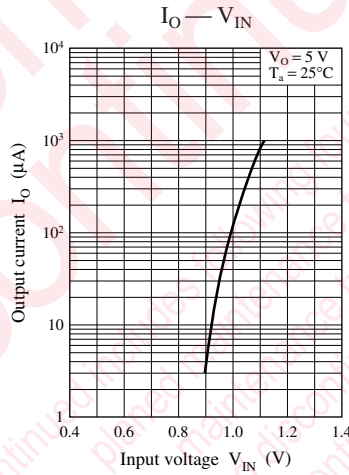
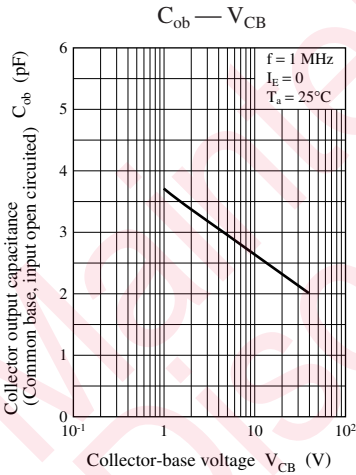
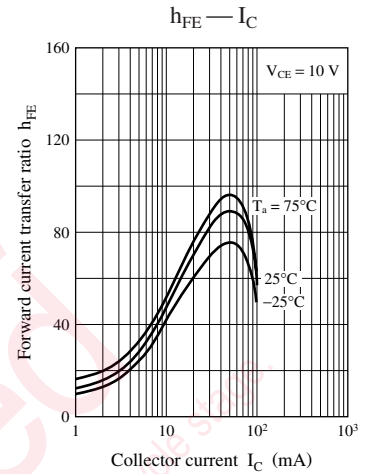
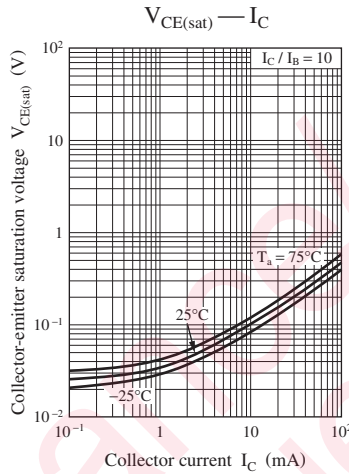
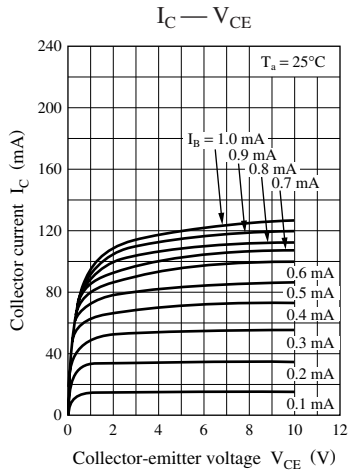


Characteristics charts of UNR5217G

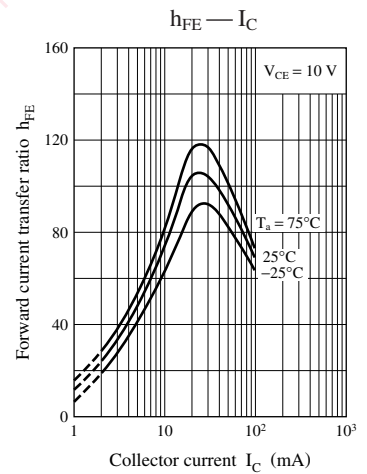
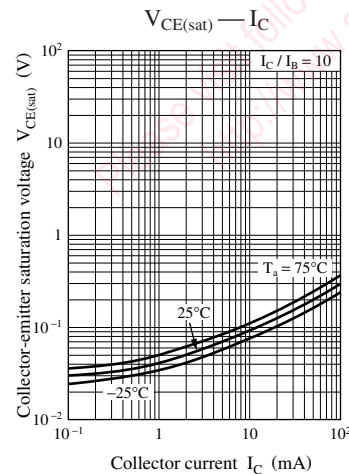
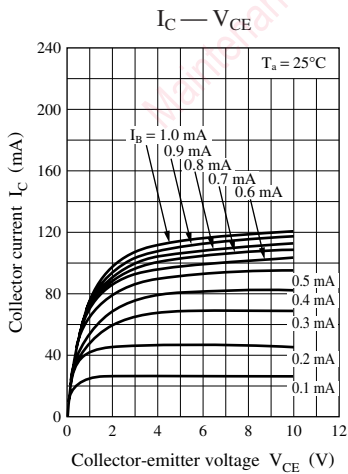


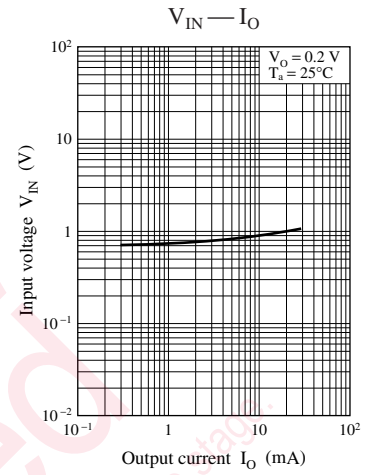
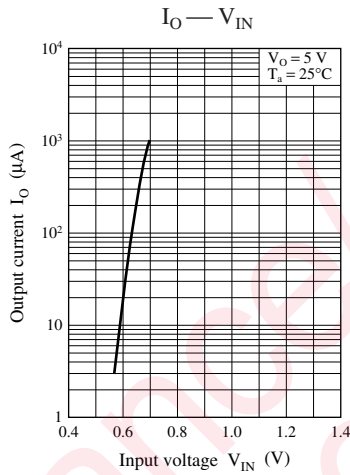
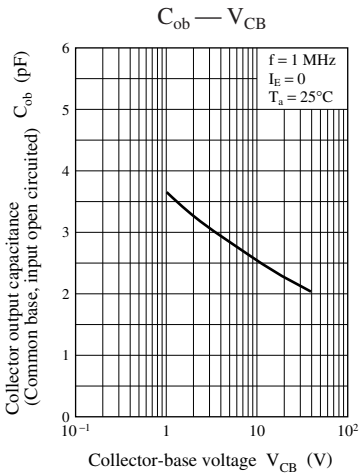


**Characteristics charts of UNR5218G**

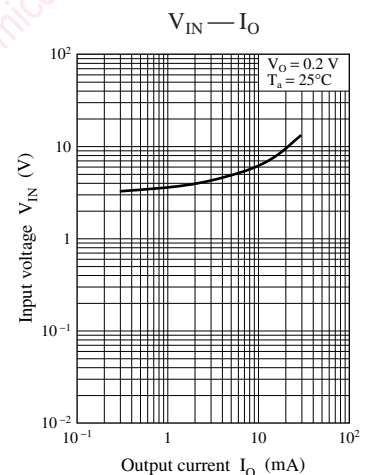
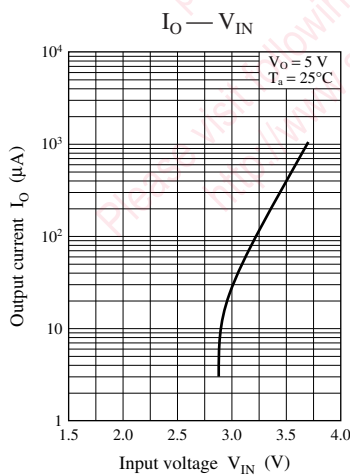
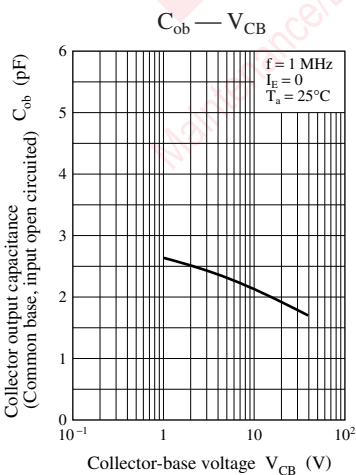
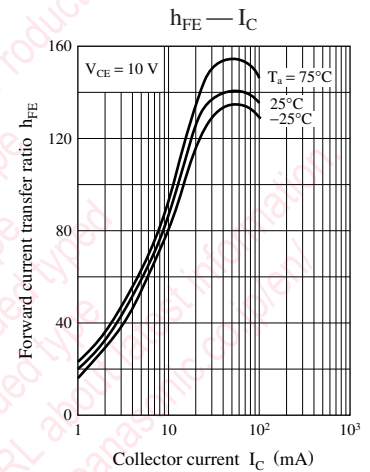
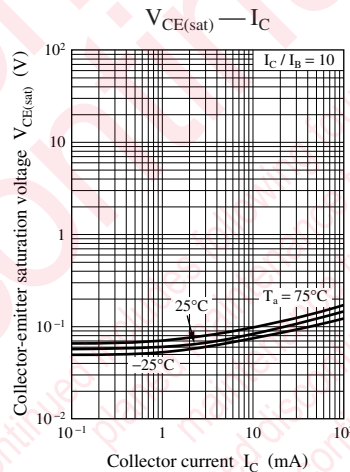
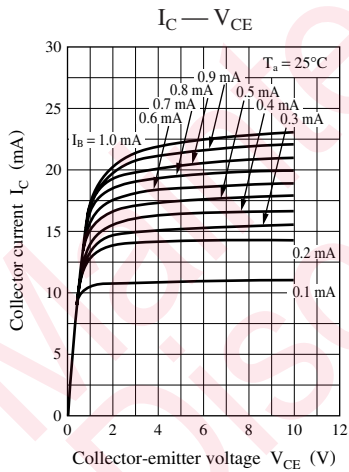


**Characteristics charts of UNR5219G**

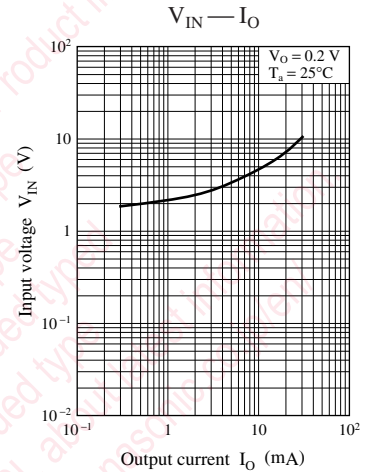
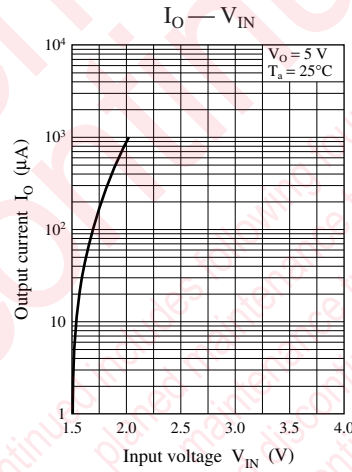
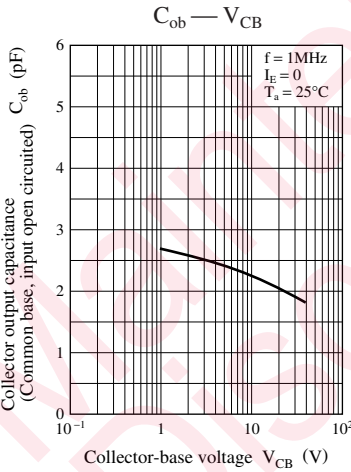
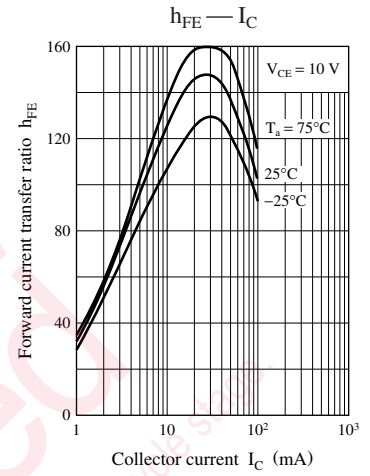
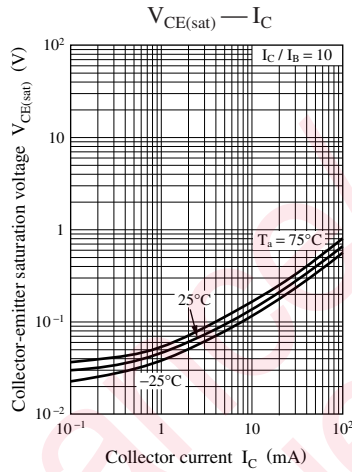
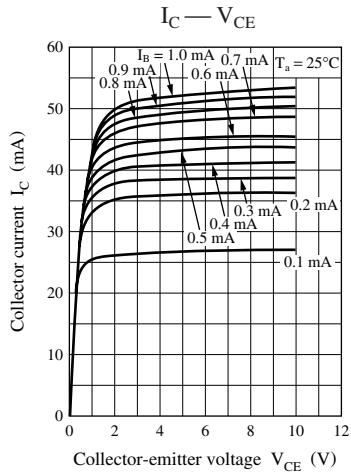




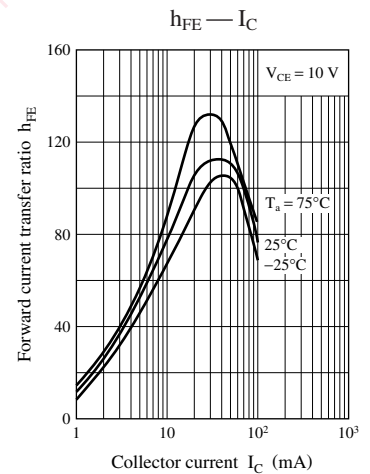
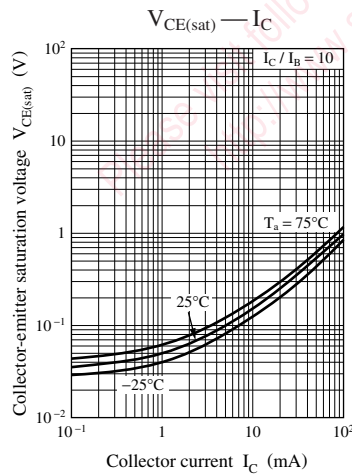
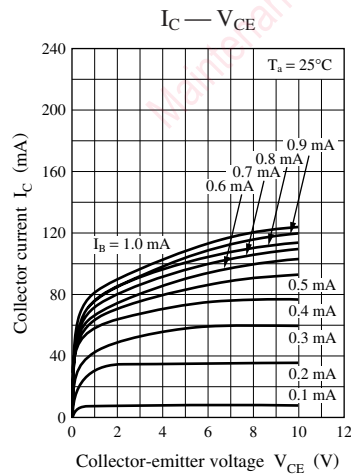
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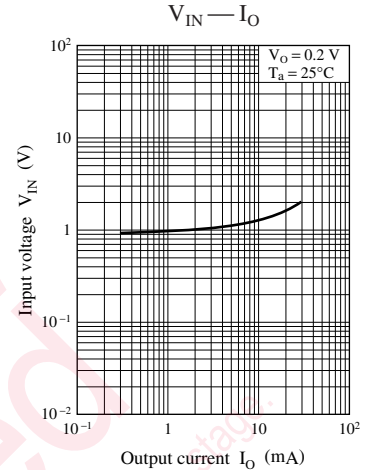
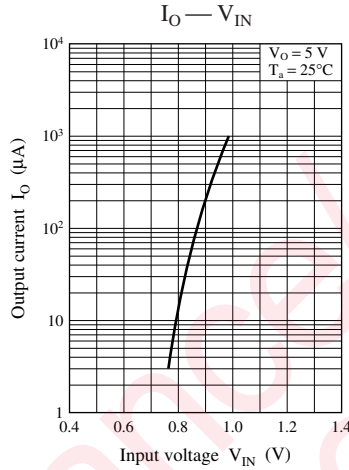
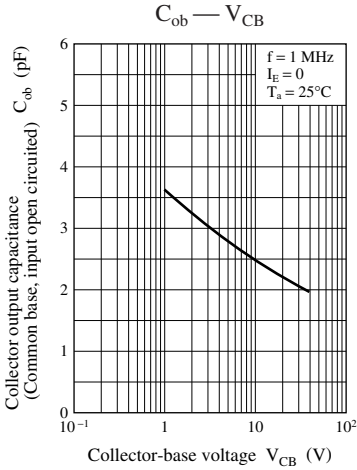


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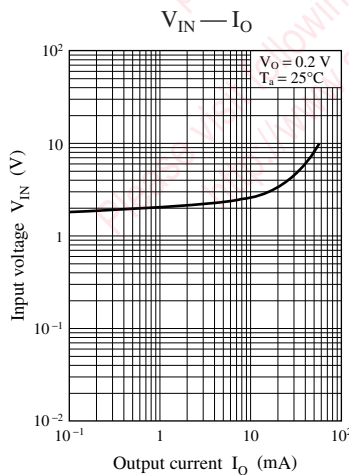
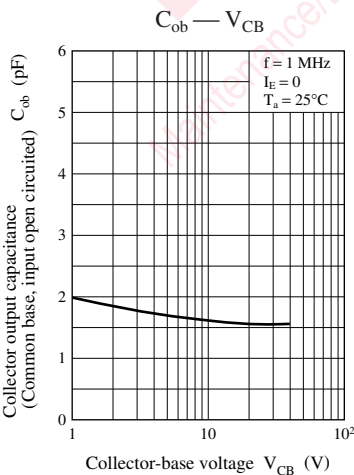
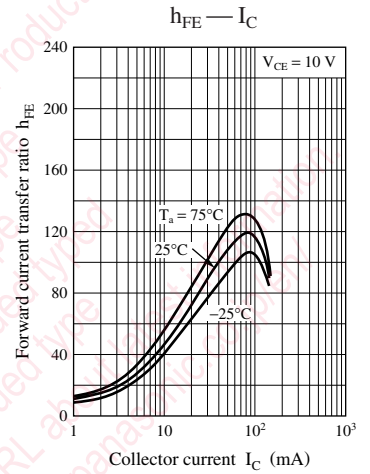
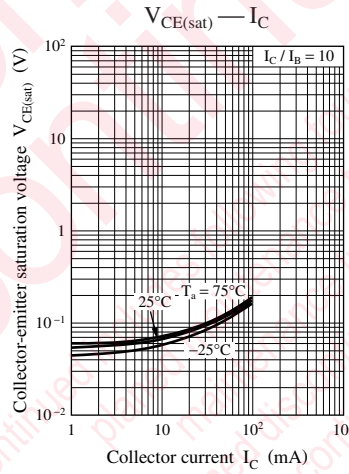
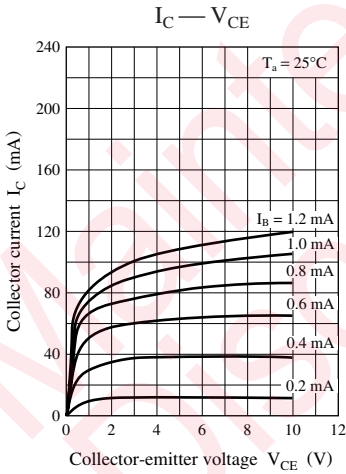


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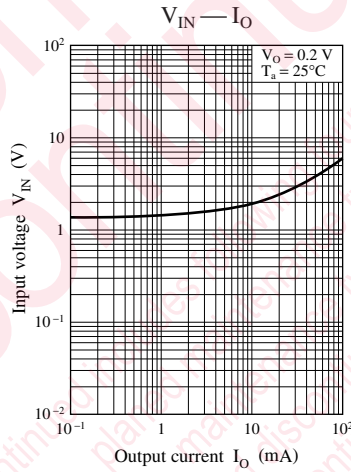
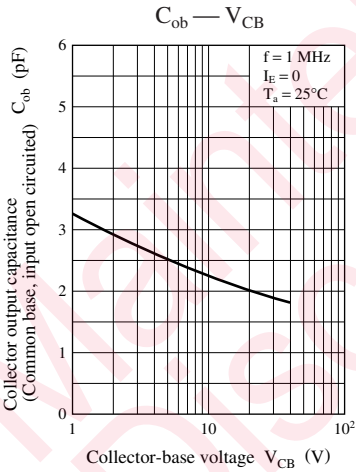
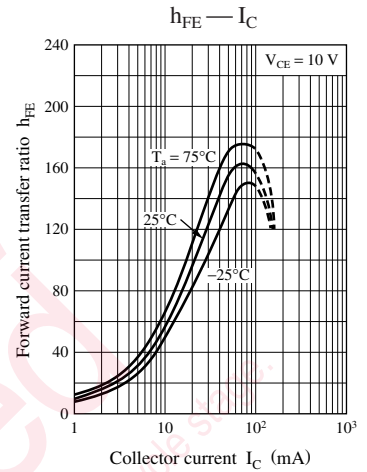
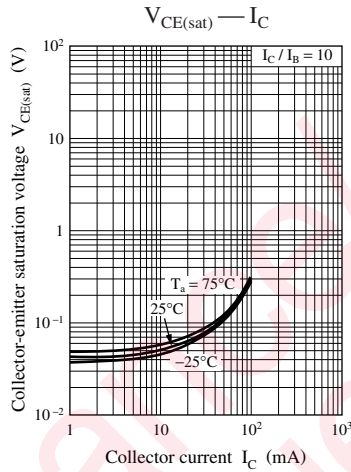
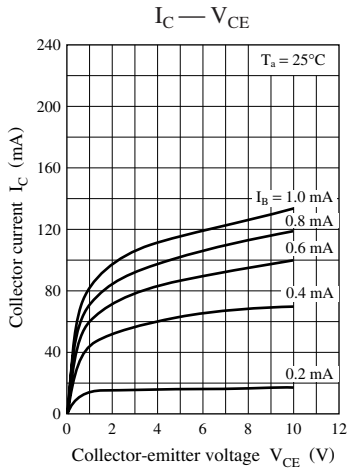




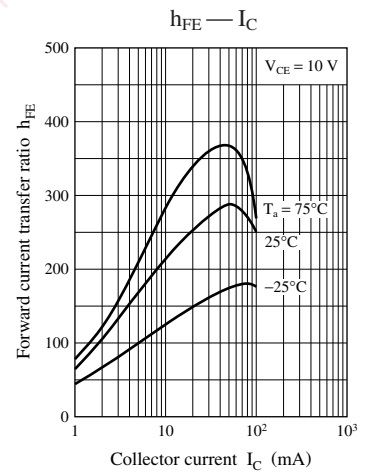
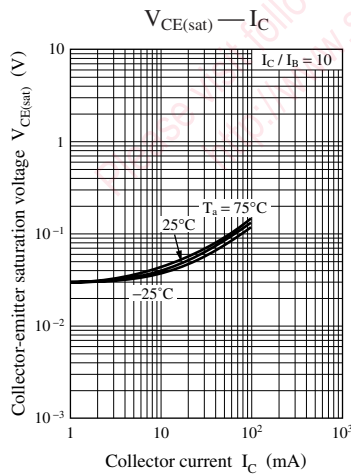
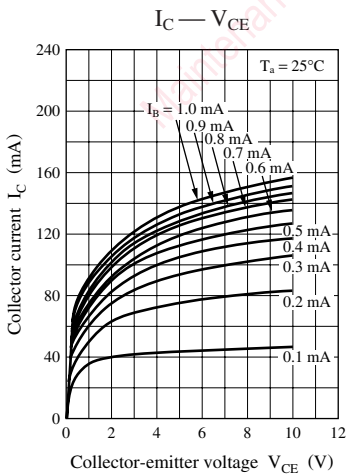
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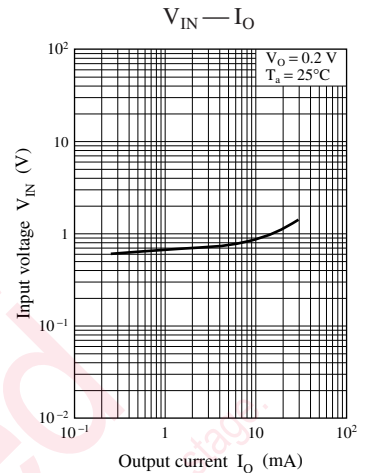
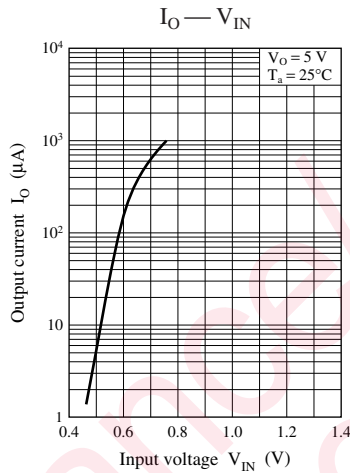
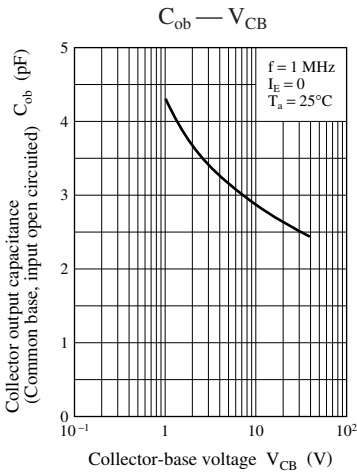


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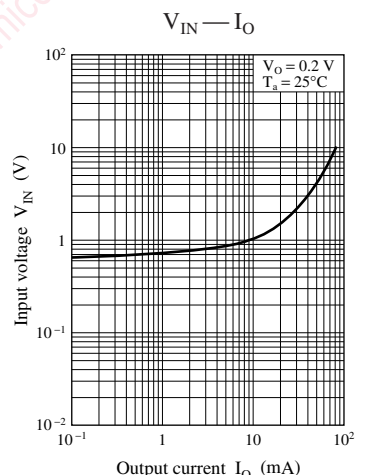
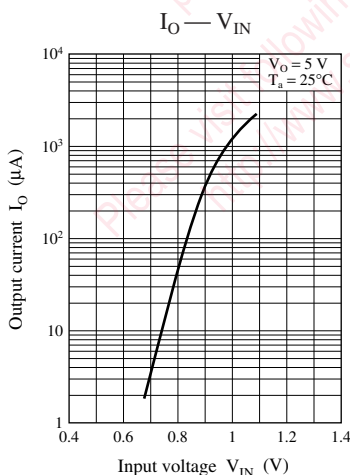
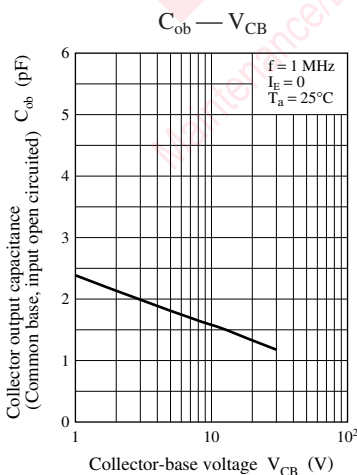
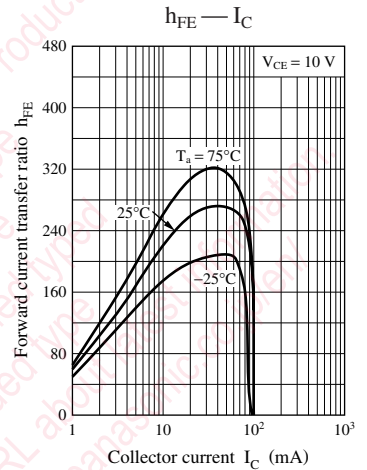
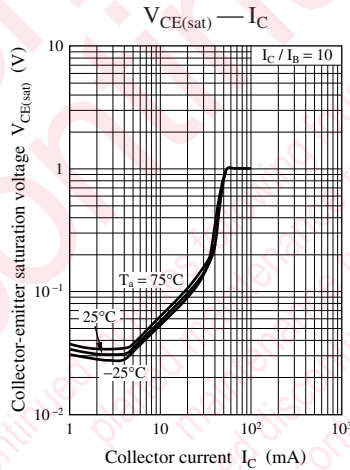
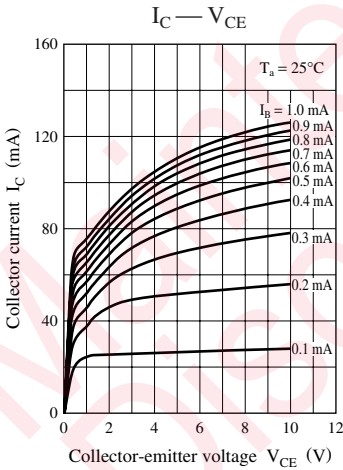


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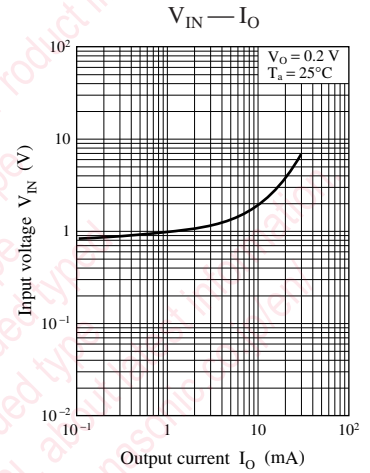
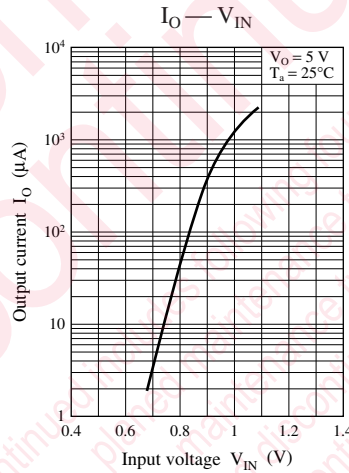
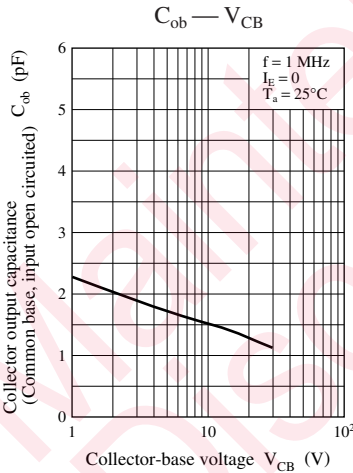
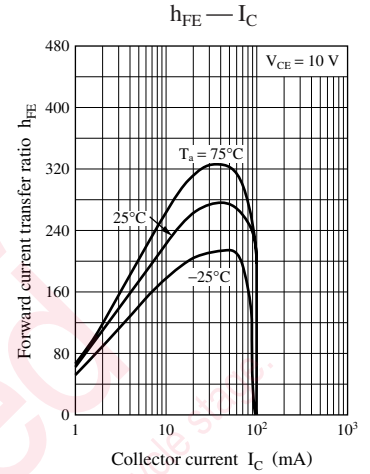
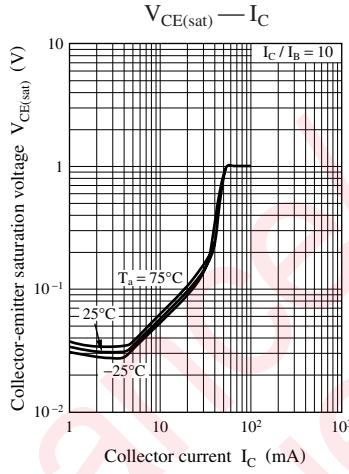
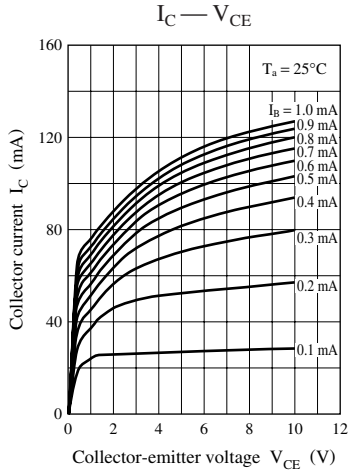




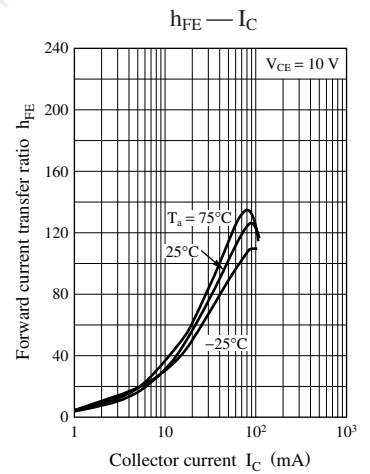
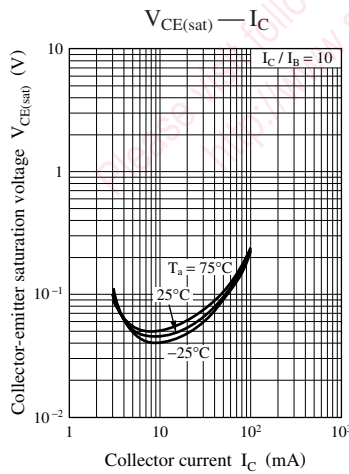
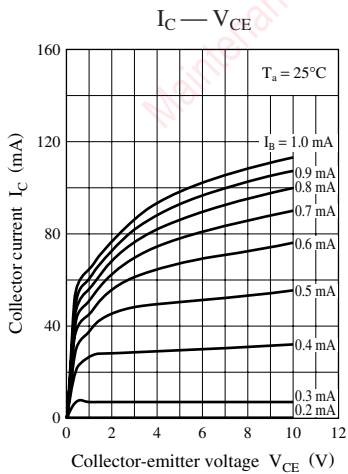
Characteristics charts of UNR521NG

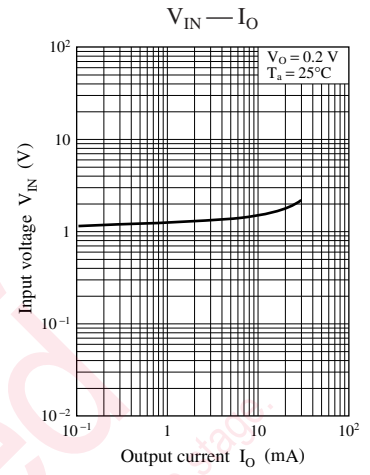
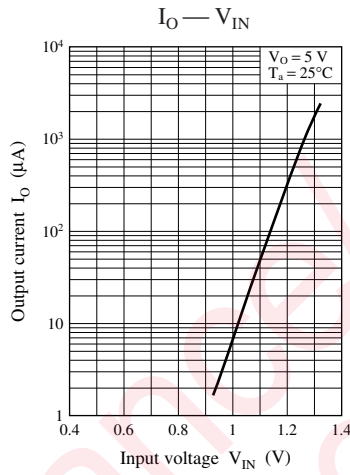
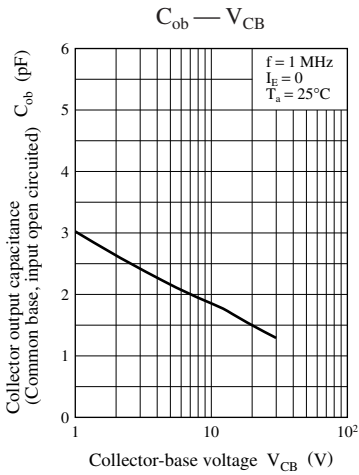


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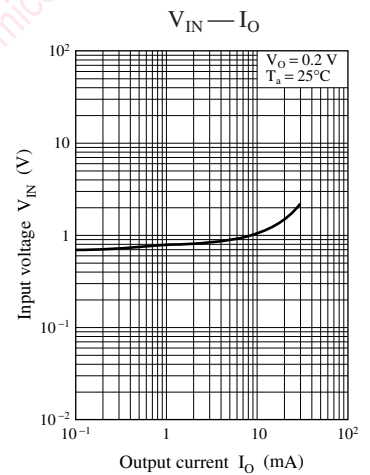
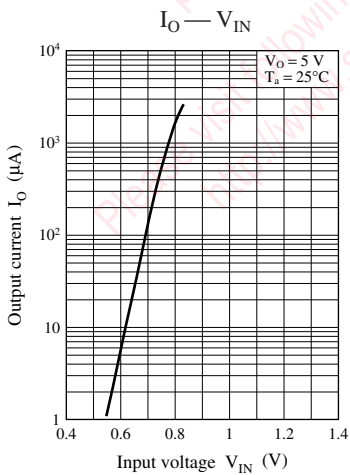
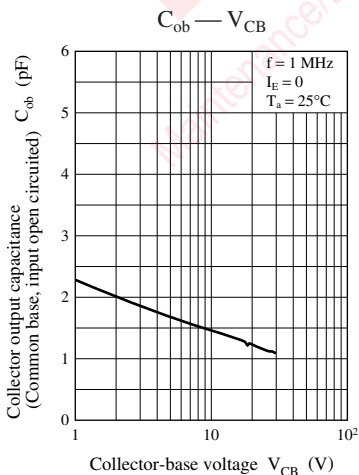
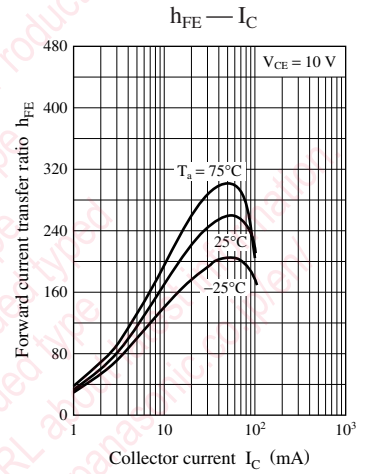
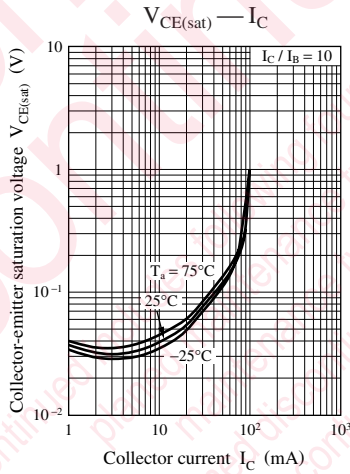
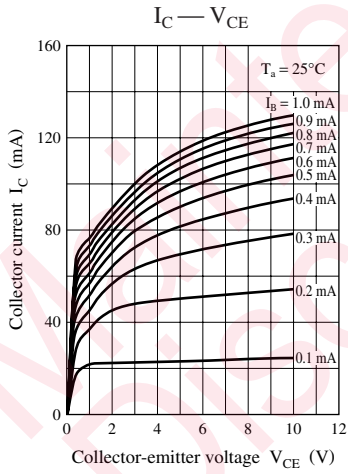


Characteristics charts of UNR521VG





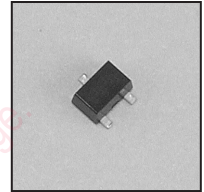
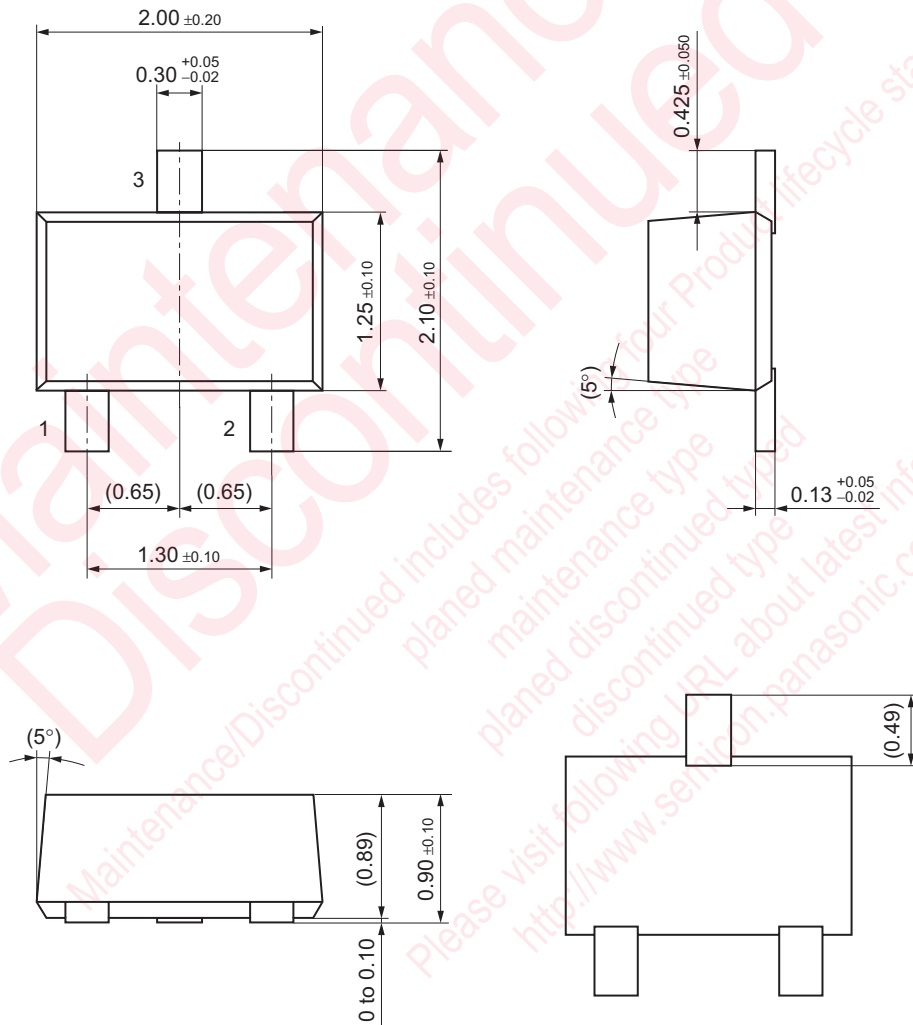
Characteristics charts of UNR521ZG





SMini3-F2

Unit: mm



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