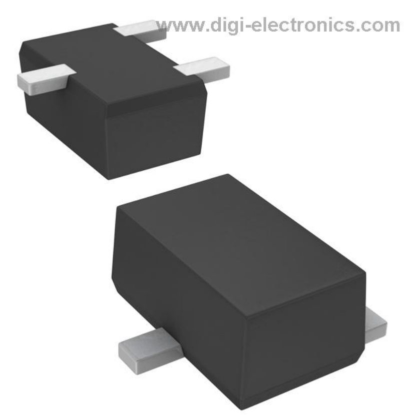
UNR521F00L Datasheet



https://www.DiGi-Electronics.com

DiGi Electronics Part Number	UNR521F00L-DG
Manufacturer	Panasonic Electronic Components
Manufacturer Product Number	UNR521F00L
Description	TRANS PREBIAS NPN 50V SMINI3
Detailed Description	Pre-Biased Bipolar Transistor (BJT) NPN - Pre-Biased 50 V 100 mA 150 MHz 150 mW Surface Mount SMini3-G1

Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
UNR521F00L	Panasonic Electronic Components
Series:	Product Status:
-	Obsolete
Transistor Type:	Current - Collector (Ic) (Max):
NPN - Pre-Biased	100 mA
Voltage - Collector Emitter Breakdown (Max):	Resistor - Base (R1):
50 V	4.7 kOhms
Resistor - Emitter Base (R2):	DC Current Gain (hFE) (Min) @ Ic, Vce:
10 kOhms	30 @ 5mA, 10V
Vce Saturation (Max) @ Ib, Ic:	Current - Collector Cutoff (Max):
250mV @ 300µA, 10mA	500nA
Frequency - Transition:	Power - Max:
150 MHz	150 mW
Mounting Type:	Package / Case:
Surface Mount	SC-70, SOT-323
Supplier Device Package:	Base Product Number:
SMini3-G1	UNR521

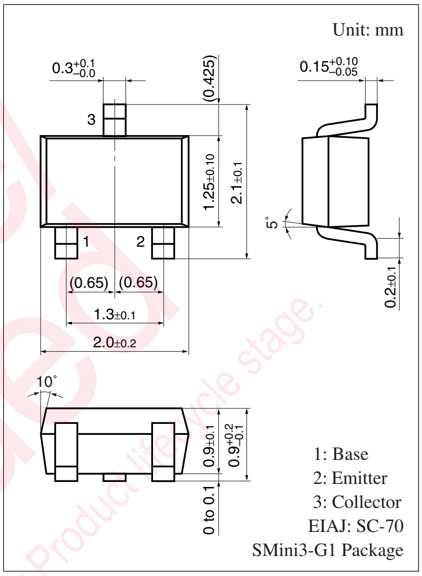
Environmental & Export classification

Moisture Sensitivity Level (MSL):	ECCN:
1 (Unlimited)	EAR99
HTSUS:	
8541.21.0075	

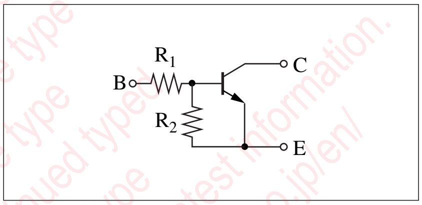
UNR521x Series (UN521x Series)

Silicon NPN epitaxial planar type

For digital circuits



Internal Connection



■ 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_1)	(R_2)
• UNR5210	(UN5210)	8L	47 kΩ	—
• UNR5211	(UN5211)	8A	10 kΩ	10 kΩ
• UNR5212	(UN5212)	8B	22 kΩ	22 kΩ
• UNR5213	(UN5213)	8C	47 kΩ	47 kΩ
• UNR5214	(UN5214)	8D	10 kΩ	47 kΩ
• UNR5215	(UN5215)	8E	10 kΩ	—
• UNR5216	(UN5216)	8F	4.7 kΩ	—
• UNR5217	(UN5117)	8H	22 kΩ	—
• UNR5218	(UN5218)	8I	0.51 kΩ	5.1 kΩ
• UNR5219	(UN5219)	8K	1 kΩ	10 kΩ
• UNR521D	(UN521D)	8M	47 kΩ	10 kΩ
• UNR521E	(UN521E)	8N	47 kΩ	22 kΩ
• UNR521F	(UN521F)	8O	4.7 kΩ	10 kΩ
• UNR521K	(UN521K)	8P	10 kΩ	4.7 kΩ
• UNR521L	(UN521L)	8Q	4.7 kΩ	4.7 kΩ
• UNR521M	(UN521M)	EL	2.2 kΩ	47 kΩ
• UNR521N	(UN521N)	EX	4.7 kΩ	47 kΩ
• UNR521T	(UN521T)	EZ	22 kΩ	47 kΩ
• UNR521V	(UN521V)	FD	2.2 kΩ	2.2 kΩ
• UNR521Z	(UN521Z)	FF	4.7 kΩ	22 kΩ

■ Absolute Maximum Ratings $T_a = 25°C$

Parameter	Symbol	Rating	Unit
Collector-base voltage (Emitter open)	V_{CBO}	50	V
Collector-emitter voltage (Base open)	V_{CEO}	50	V
Collector current	I_C	100	mA
Total power dissipation	P_T	150	mW
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	−55 to +150	°C

Note) The part numbers in the parenthesis show conventional part number.

■ Electrical Characteristics $T_a = 25°C \pm 3°C$

Parameter		Symbol	Conditions	Min	Typ	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}	$I_C = 2$ mA, $I_B = 0$	50			V
Collector-base cutoff current (Emitter open)		I_{CBO}	$V_{CB} = 50$ V, $I_E = 0$			0.1	μA
Collector-emitter cutoff current (Base open)		I_{CEO}	$V_{CE} = 50$ V, $I_B = 0$			0.5	
Emitter-base cutoff current (Collector open)	UNR5210/5215/5216/5217	I_{EBO}	$V_{EB} = 6$ V, $I_C = 0$			0.01	mA
	UNR5213					0.1	
	UNR5212/5214/521D/521E/521M/521N/521T					0.2	
	UNR521Z					0.4	
	UNR5211					0.5	
	UNR521F/521K					1.0	
	UNR5219					1.5	
	UNR5218/521L/521V					2.0	
Forward current transfer ratio	UNR521V	h_{FE}	$V_{CE} = 10$ V, $I_C = 5$ mA	6		20	—
	UNR5218/521K/521L			20			
	UNR5219/521D/521F			30			
	UNR5211			35			
	UNR5212/521E			60			
	UNR521Z			60		200	
	UNR5213/5214/521M			80			
	UNR521N/521T			80		400	
	UNR5210*/5215*/5216*/5217*			160		460	
Collector-emitter saturation voltage		$V_{CE(sat)}$	$I_C = 10$ mA, $I_B = 0.3$ mA			0.25	V
	UNR521V		$I_C = 10$ mA, $I_B = 1.5$ mA				
Output voltage high-level		V_{OH}	$V_{CC} = 5$ V, $V_B = 0.5$ V, $R_L = 1$ kΩ	4.9			V
Output voltage low-level		V_{OL}	$V_{CC} = 5$ V, $V_B = 2.5$ V, $R_L = 1$ kΩ			0.2	V
	UNR5213/521K		$V_{CC} = 5$ V, $V_B = 3.5$ V, $R_L = 1$ kΩ				
	UNR521D		$V_{CC} = 5$ V, $V_B = 10$ V, $R_L = 1$ kΩ				
	UNR521E		$V_{CC} = 5$ V, $V_B = 6.0$ V, $R_L = 1$ kΩ				
Transition frequency		f_T	$V_{CB} = 10$ V, $I_E = -2$ mA, $f = 200$ MHz		150		MHz
Input resistance	UNR5218	R_1		−30%	0.51	+30%	kΩ
	UNR5219				1.0		
	UNR521M/521V				2.2		
	UNR5216/521F/521L/521N UNR521Z				4.7		
	UNR5211/5214/5215/521K				10		
	UNR5212/5217/521T				22		
	UNR5210/5213/521D/521E				47		

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

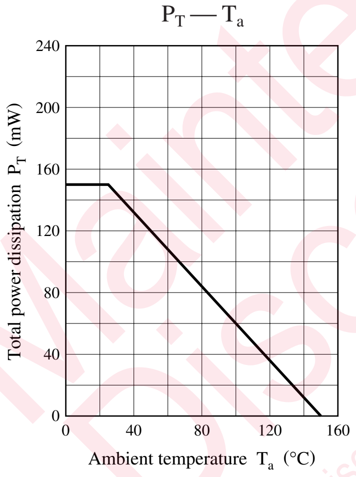
2. *: Rank classification

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

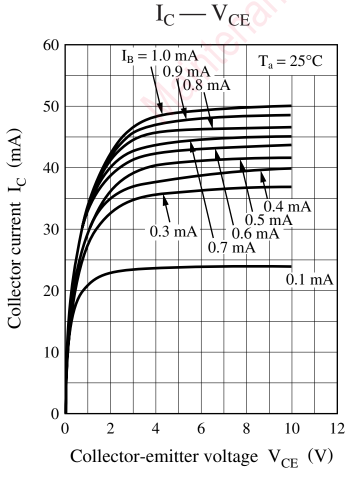
■ Electrical Characteristics (continued) $T_a = 25°C \pm 3°C$

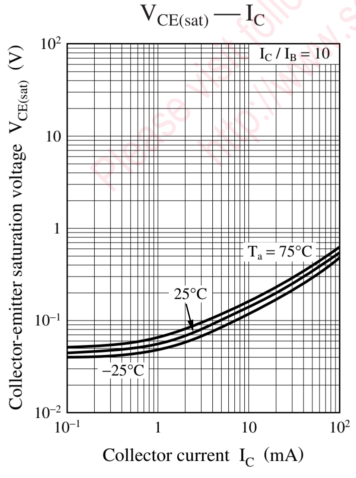
Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Resistance ratio	UNR521M	R_1/R_2			0.047		—
	UNR521N				0.1		
	UNR5218/5219			0.08	0.10	0.12	
	UNR521Z				0.21		
	UNR5214			0.17	0.21	0.25	
	UNR521T				0.47		
	UNR521F			0.37	0.47	0.57	
	UNR521V				1.0		
	UNR5211/5212/5213/521L			0.8	1.0	1.2	
	UNR521K			1.70	2.13	2.60	
	UNR521E			1.70	2.14	2.60	
	UNR521D			3.7	4.7	5.7	

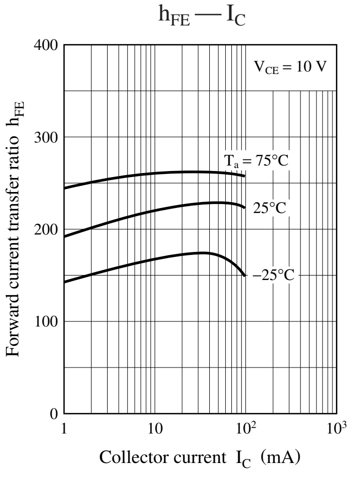
Common characteristics chart



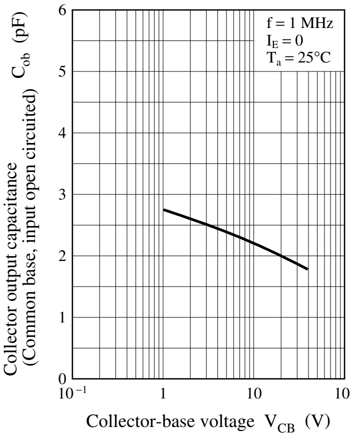
Characteristics charts of UNR5210



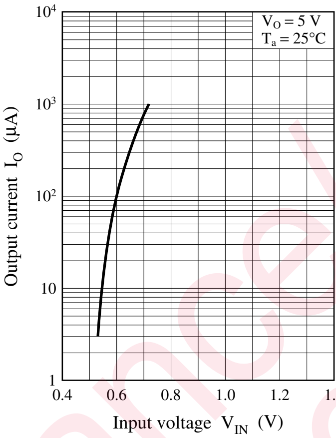




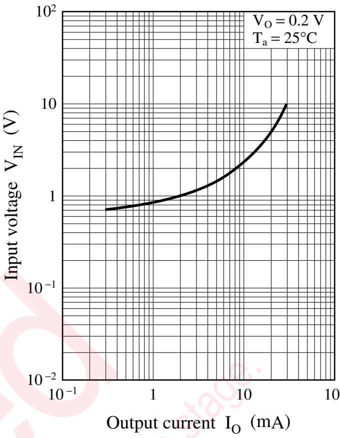
C_{ob} — V_{CB}



I_O — V_{IN}

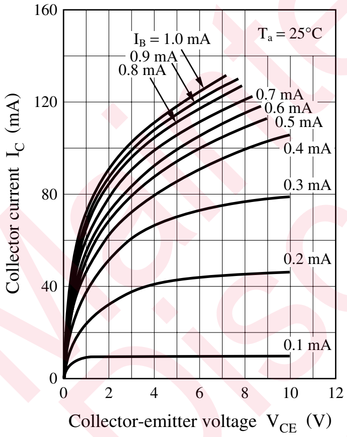


V_{IN} — I_O

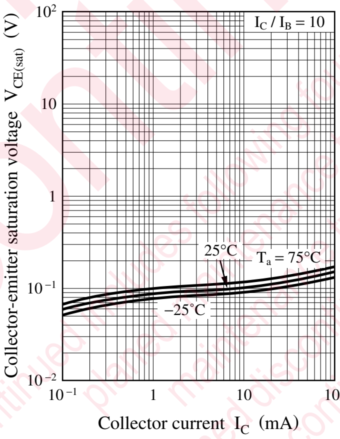


Characteristics charts of UNR5211

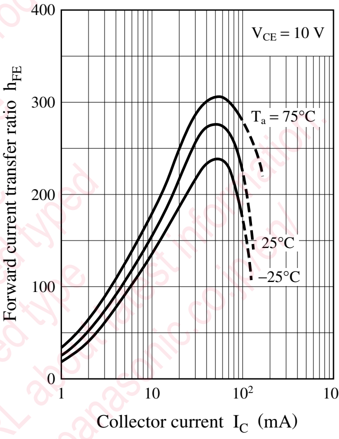
I_C — V_{CE}



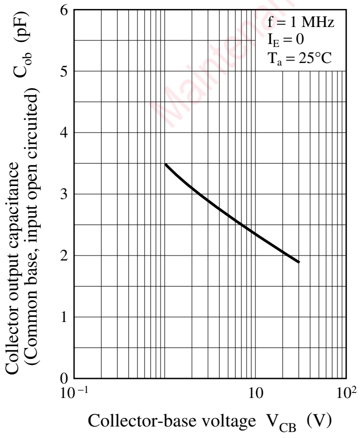
$V_{CE(sat)}$ — I_C



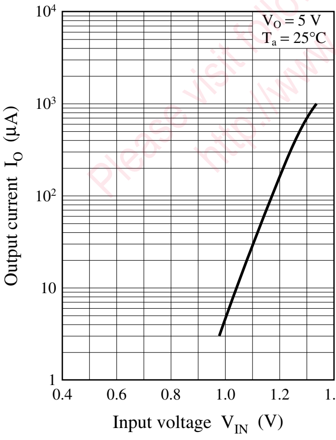
h_{FE} — I_C



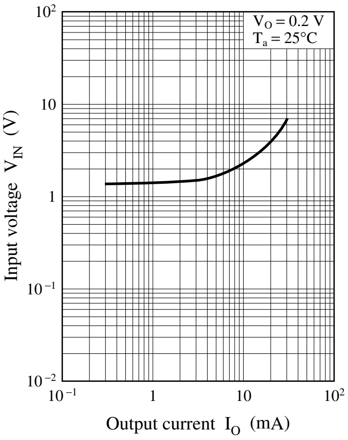
C_{ob} — V_{CB}



I_O — V_{IN}

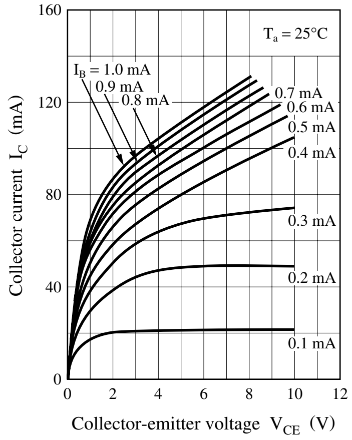


V_{IN} — I_O

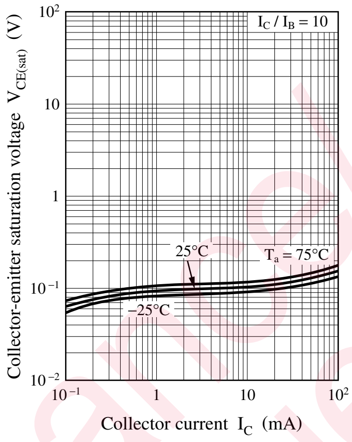


Characteristics charts of UNR5212

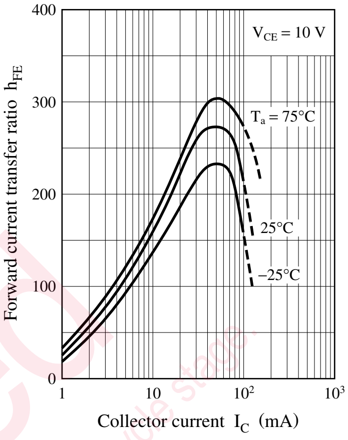
I_C — V_{CE}



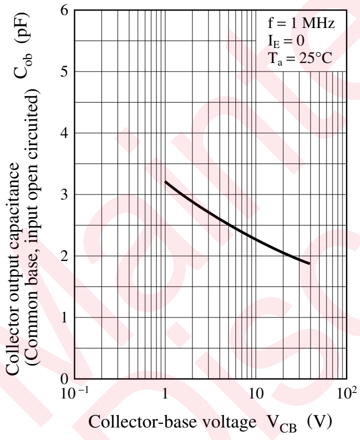
$V_{CE(sat)}$ — I_C



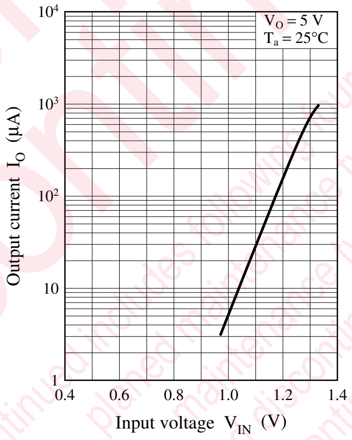
h_{FE} — I_C



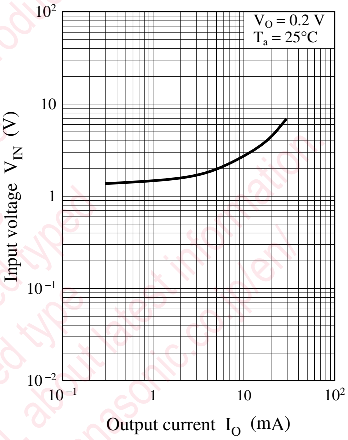
C_{ob} — V_{CB}



I_O — V_{IN}

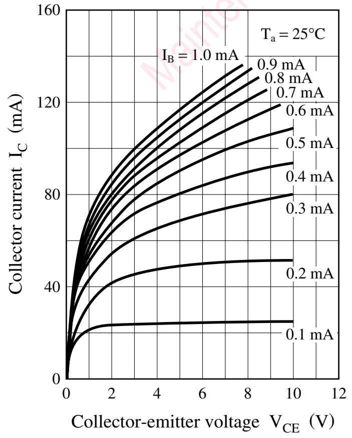


V_{IN} — I_O

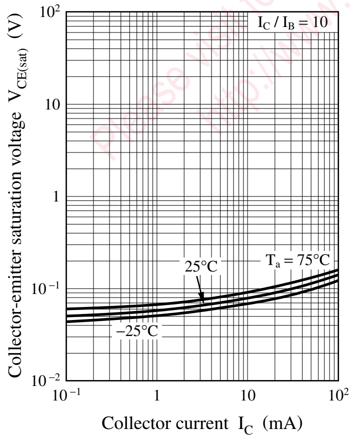


Characteristics charts of UNR5213

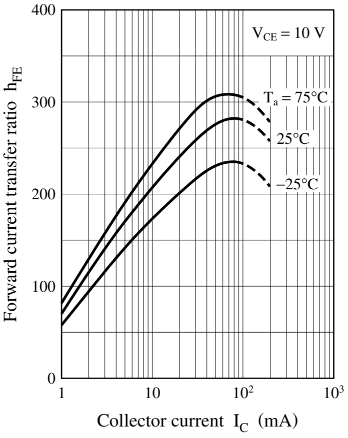
I_C — V_{CE}

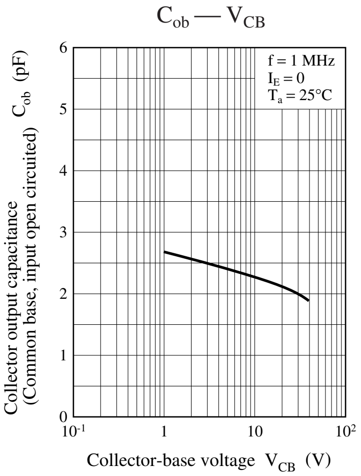


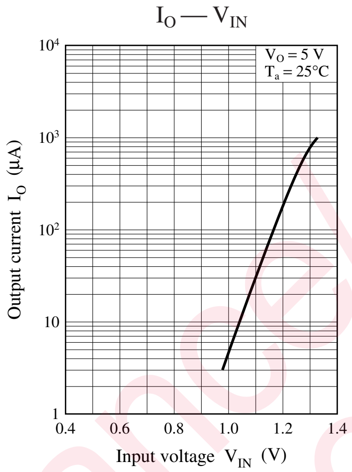
$V_{CE(sat)}$ — I_C

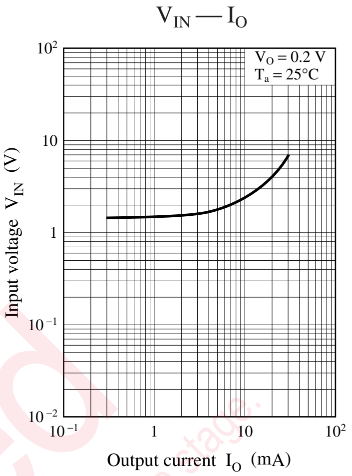


h_{FE} — I_C

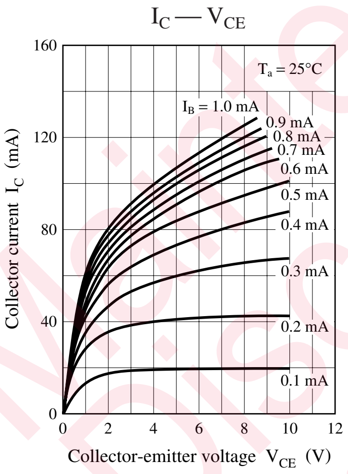


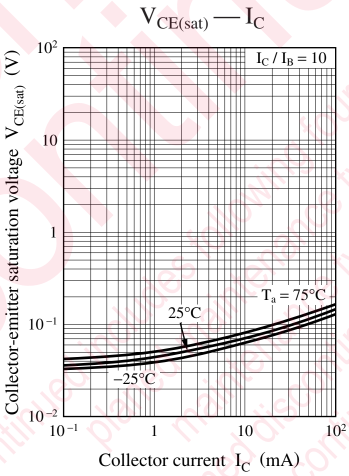


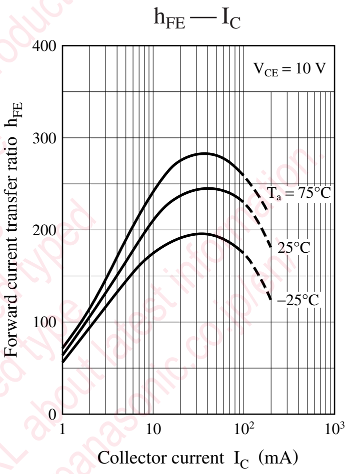


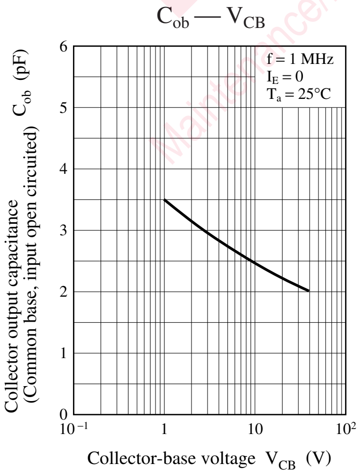


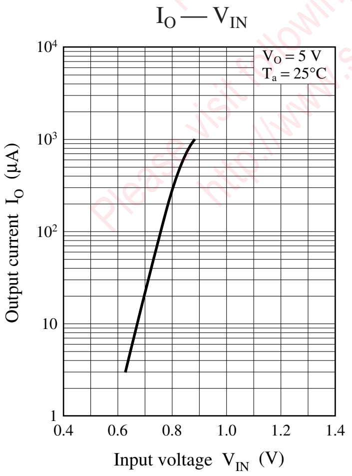
Characteristics charts of UNR5214

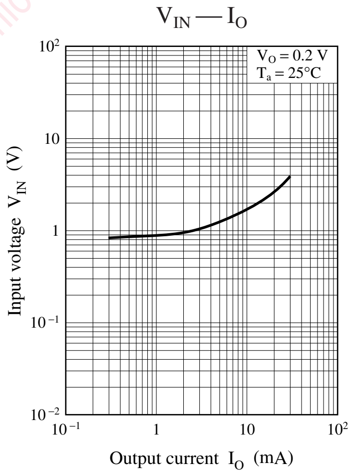






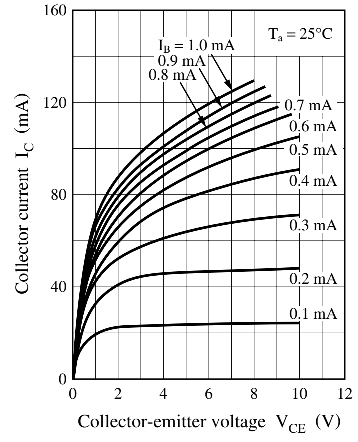




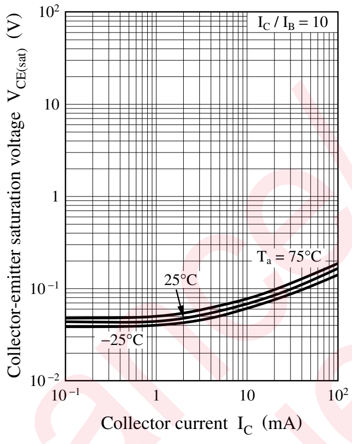


Characteristics charts of UNR5215

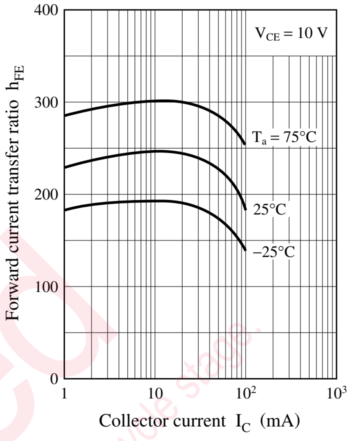
I_C — V_{CE}



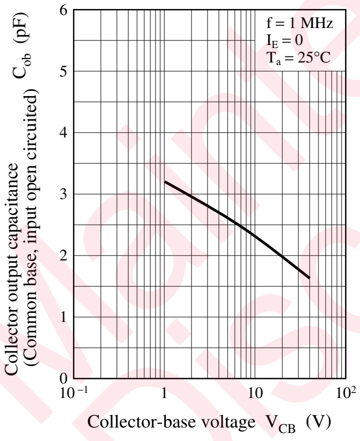
$V_{CE(sat)}$ — I_C



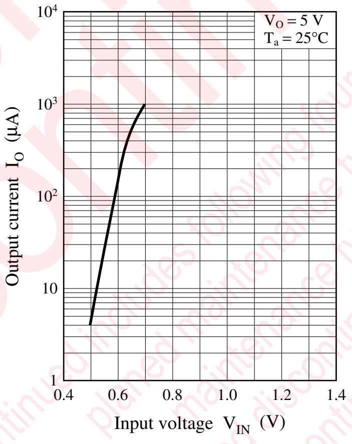
h_{FE} — I_C



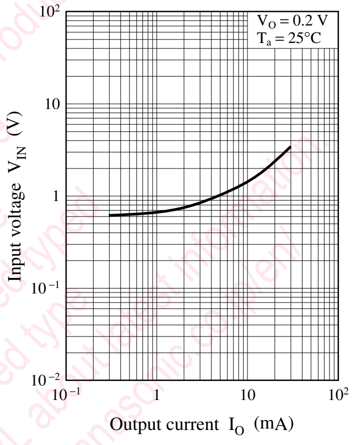
C_{ob} — V_{CB}



I_O — V_{IN}

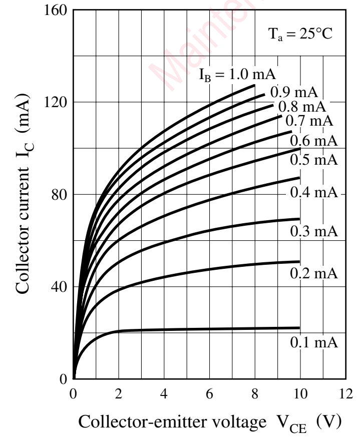


V_{IN} — I_O

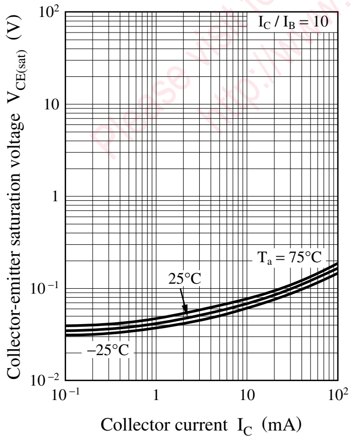


Characteristics charts of UNR5216

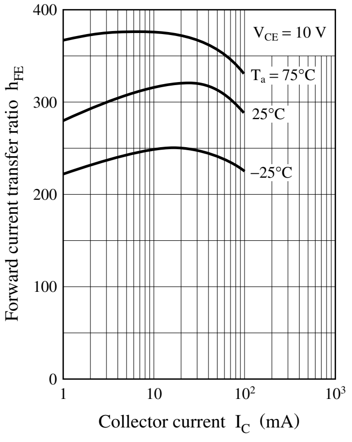
I_C — V_{CE}

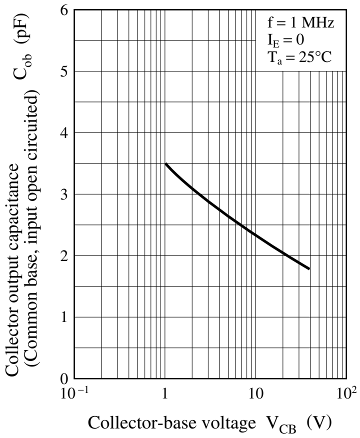


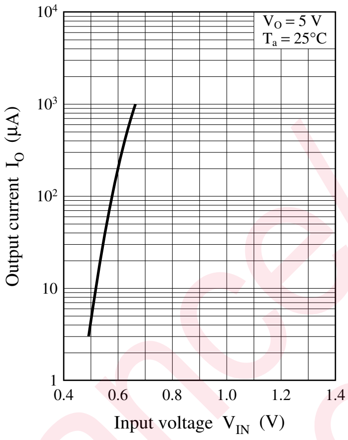
$V_{CE(sat)}$ — I_C

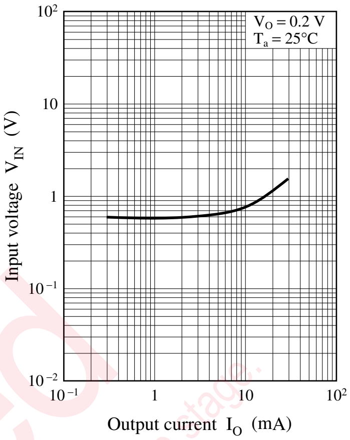


h_{FE} — I_C

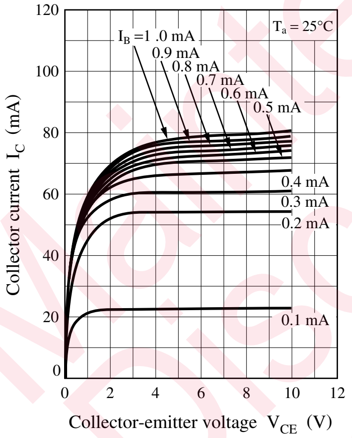


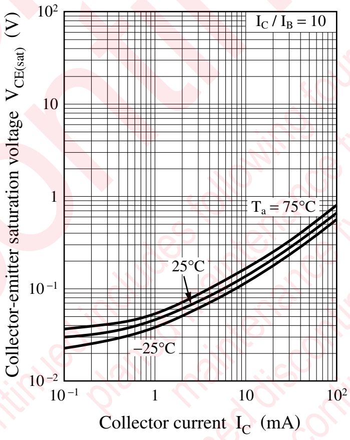

C_{ob} — V_{CB}

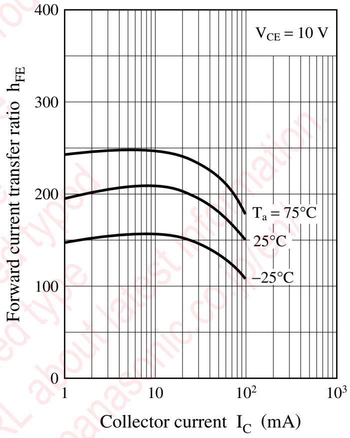

I_O — V_{IN}

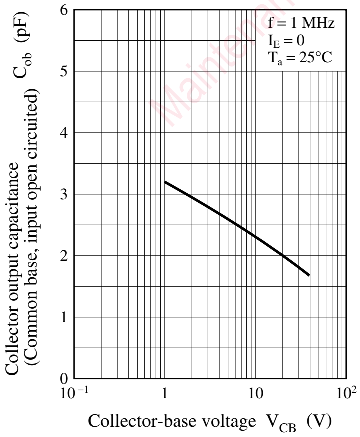

V_{IN} — I_O

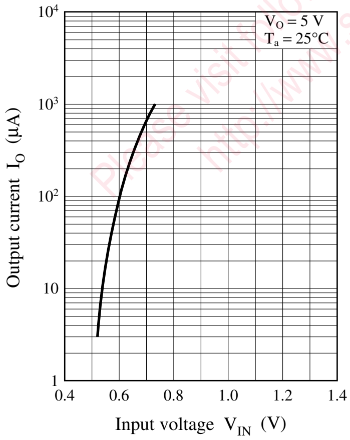
Characteristics charts of UNR5217

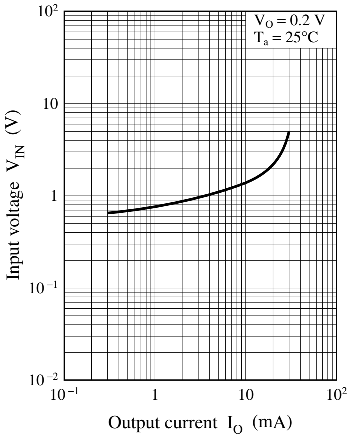

I_C — V_{CE}


$V_{CE(sat)}$ — I_C

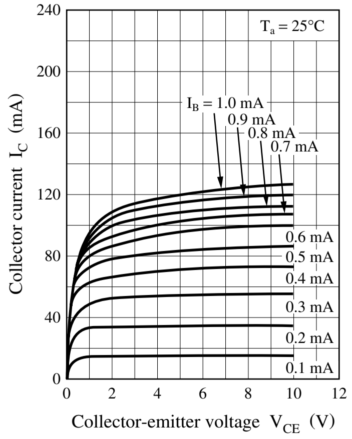

h_{FE} — I_C

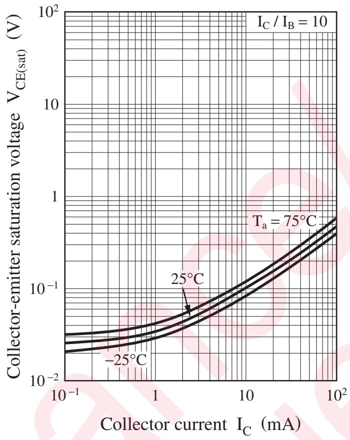

C_{ob} — V_{CB}

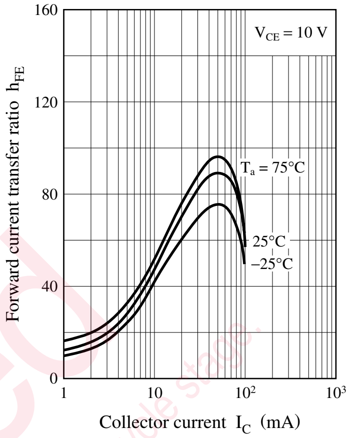

I_O — V_{IN}

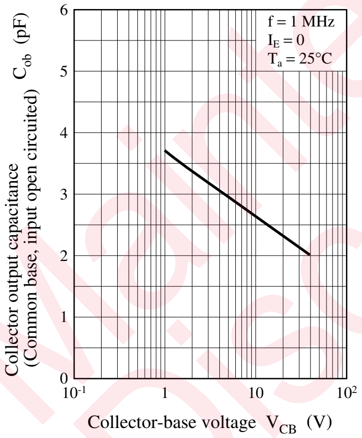

V_{IN} — I_O

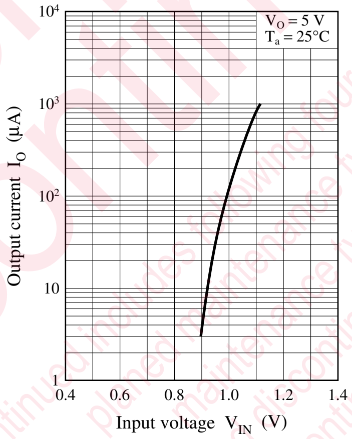
Characteristics charts of UNR5218

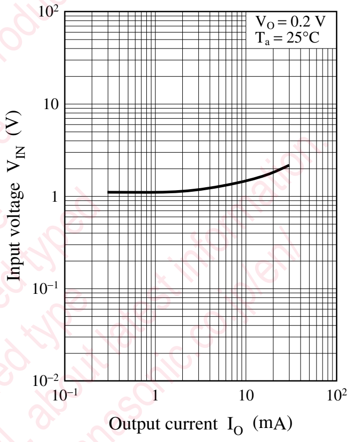

I_C — V_{CE}


$V_{CE(sat)}$ — I_C

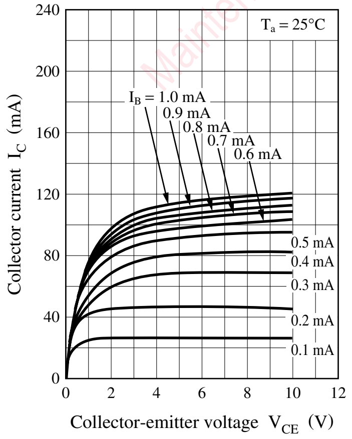

h_{FE} — I_C

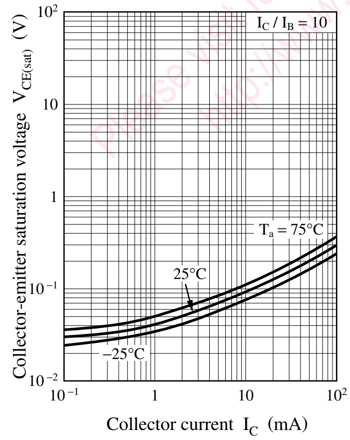

C_{ob} — V_{CB}

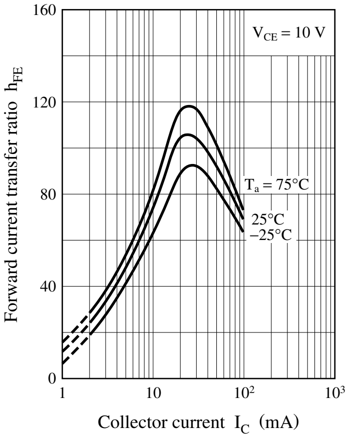

I_O — V_{IN}


V_{IN} — I_O

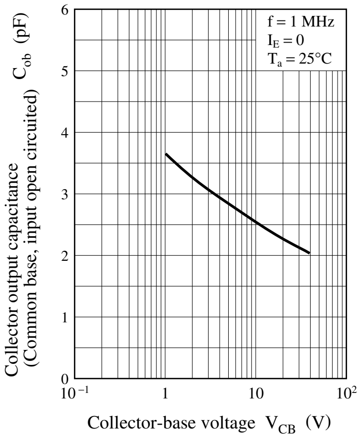
Characteristics charts of UNR5219


I_C — V_{CE}

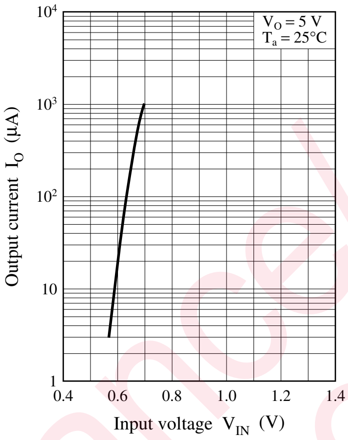

$V_{CE(sat)}$ — I_C


h_{FE} — I_C

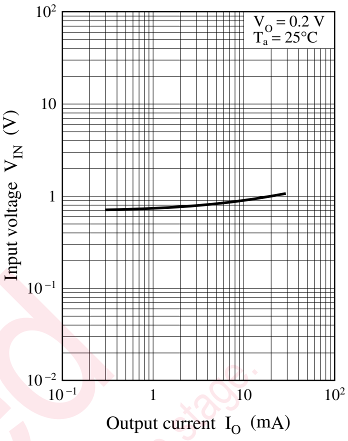
C_{ob} — V_{CB}



I_O — V_{IN}

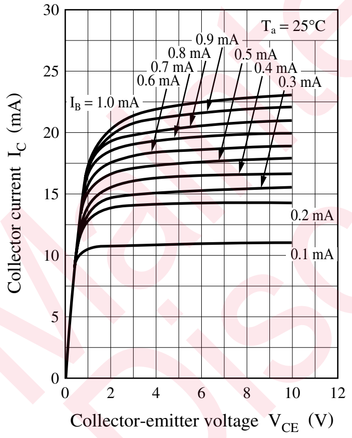


V_{IN} — I_O

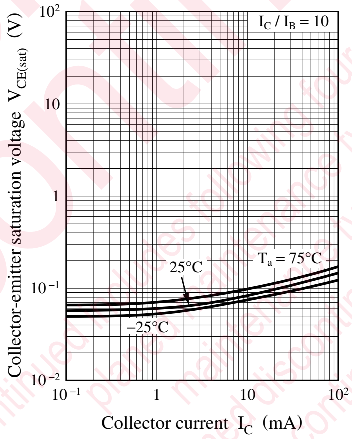


Characteristics charts of UNR521D

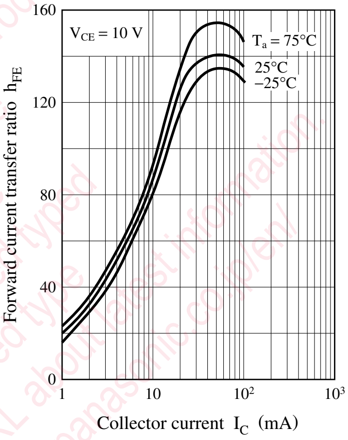
I_C — V_{CE}



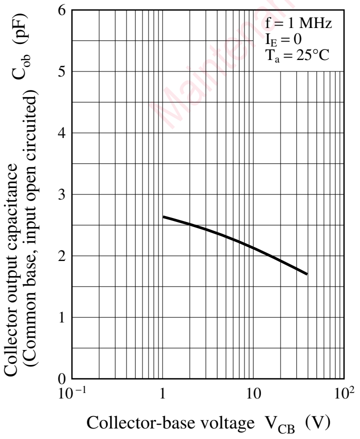
$V_{CE(sat)}$ — I_C



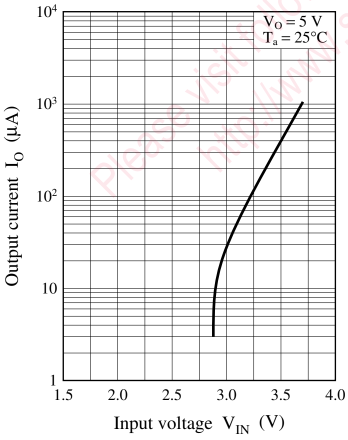
h_{FE} — I_C



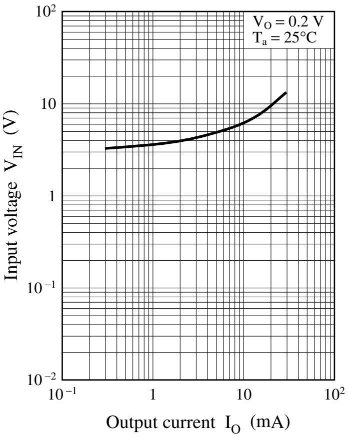
C_{ob} — V_{CB}



I_O — V_{IN}

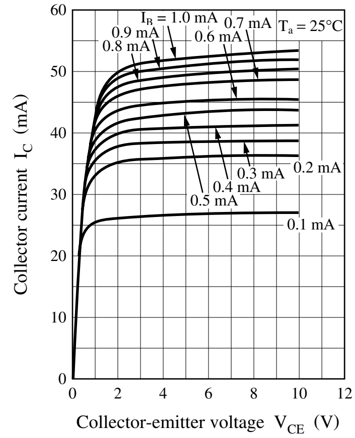


V_{IN} — I_O

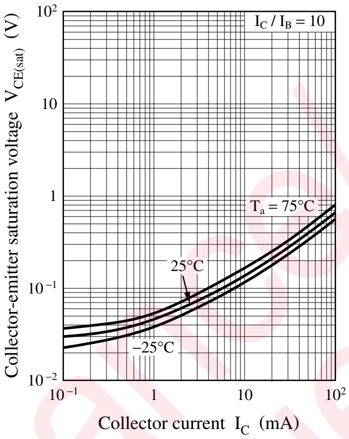


Characteristics charts of UNR521E

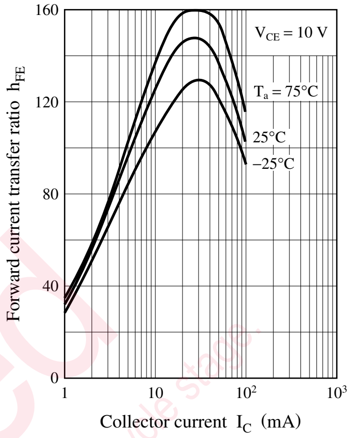
I_C — V_{CE}



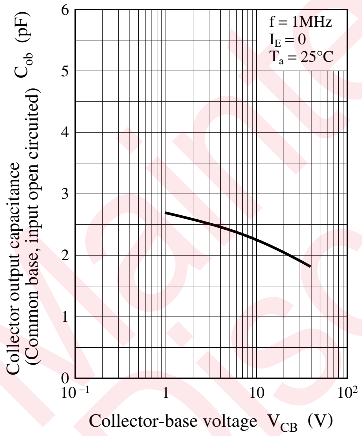
$V_{CE(sat)}$ — I_C



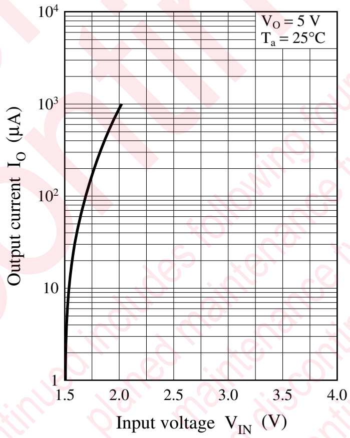
h_{FE} — I_C



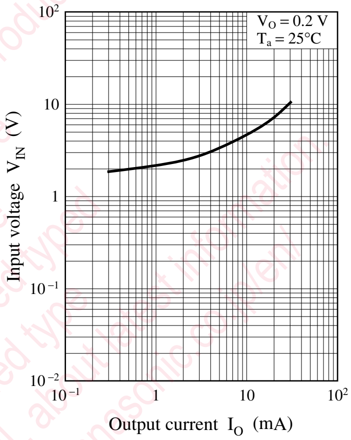
C_{ob} — V_{CB}



I_O — V_{IN}

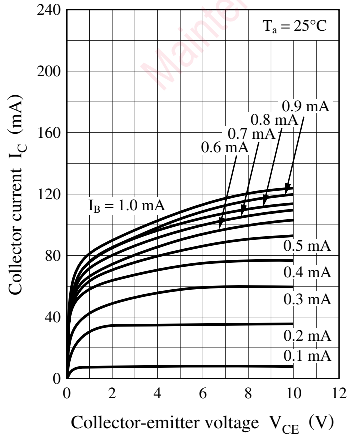


V_{IN} — I_O

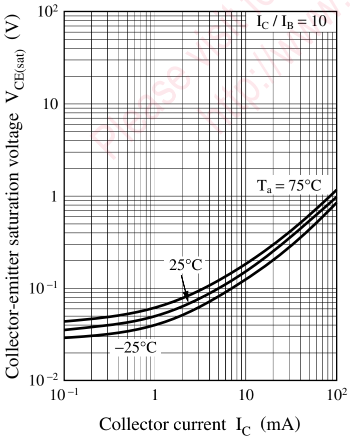


Characteristics charts of UNR521F

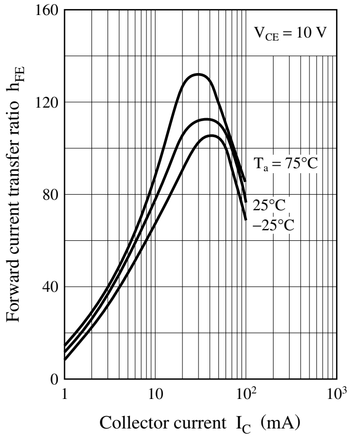
I_C — V_{CE}

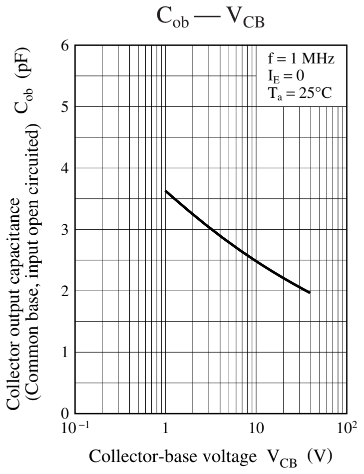


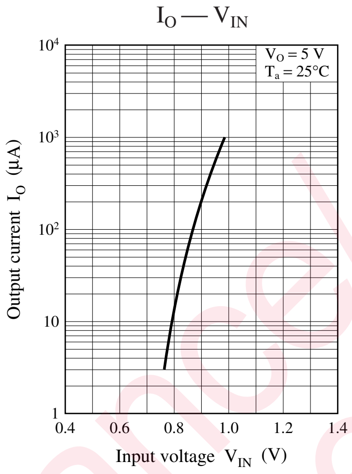
$V_{CE(sat)}$ — I_C

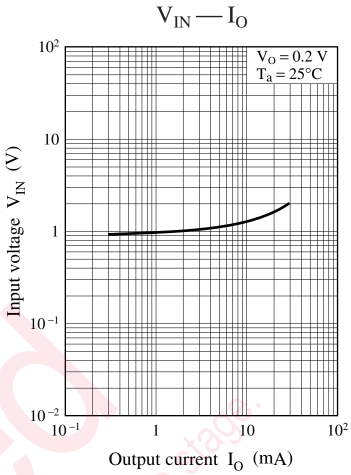


h_{FE} — I_C

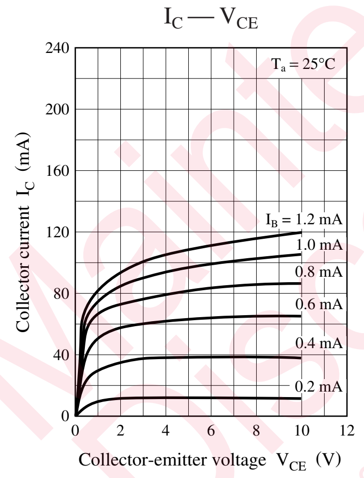


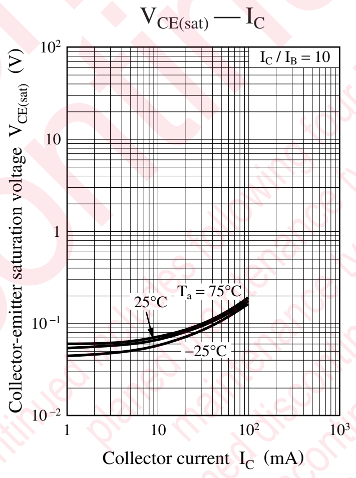


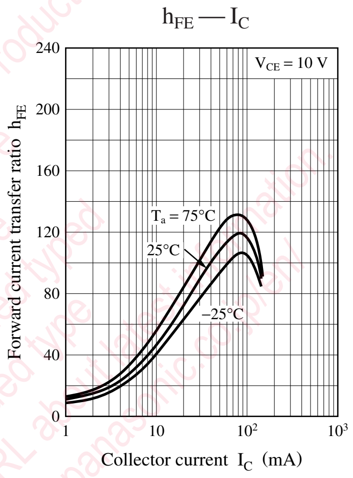


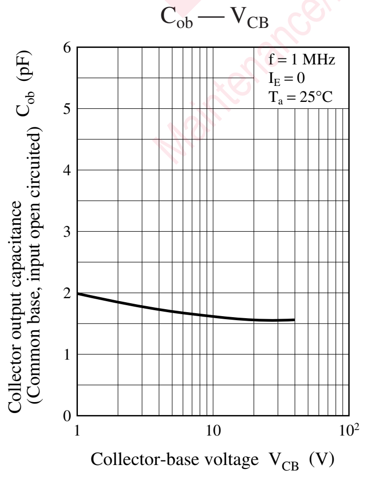


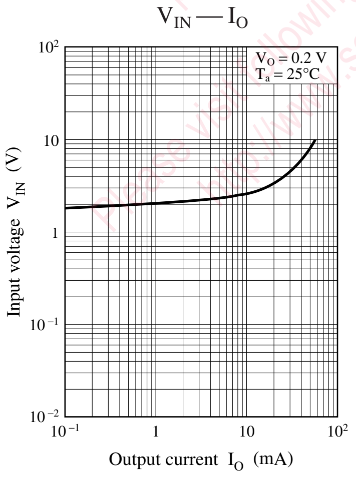
Characteristics charts of UNR521K



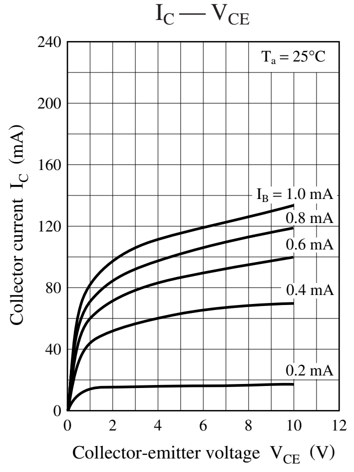


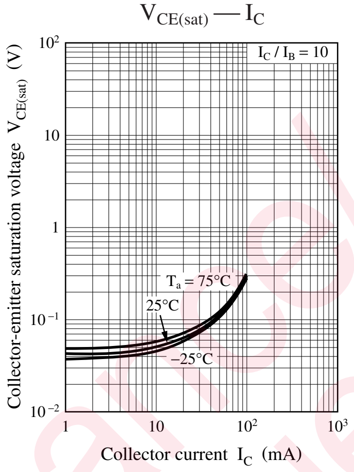


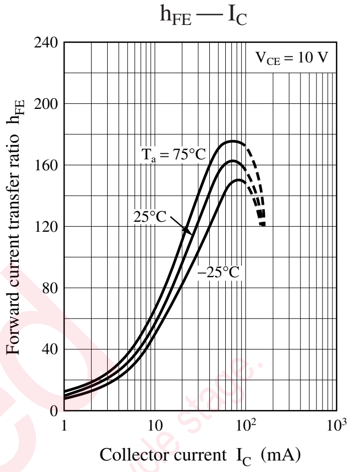


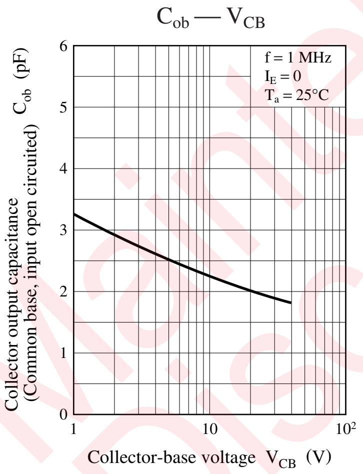


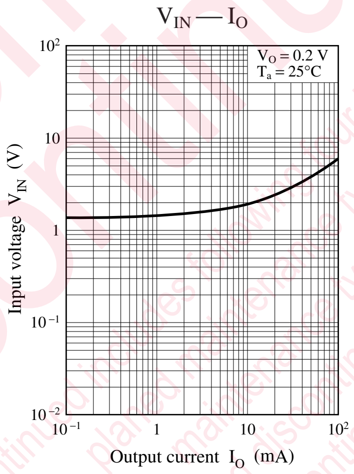
Characteristics charts of UNR521L


I_C — V_{CE}

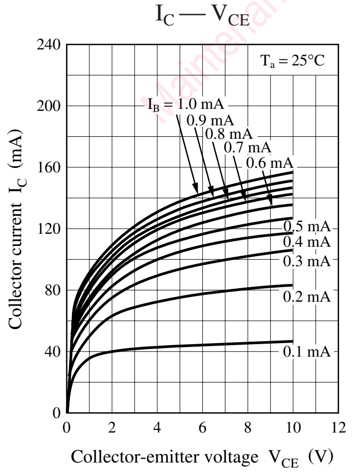

$V_{CE(sat)}$ — I_C

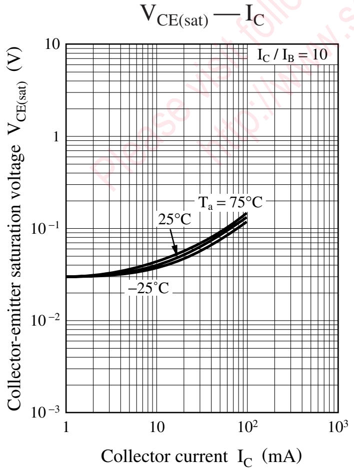

h_{FE} — I_C

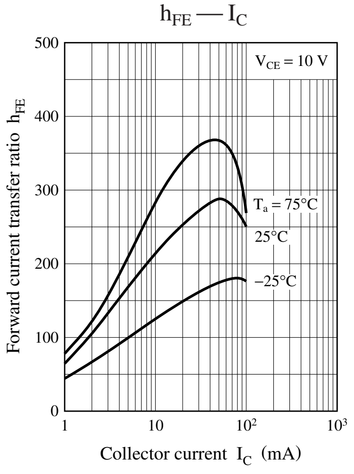

C_{ob} — V_{CB}

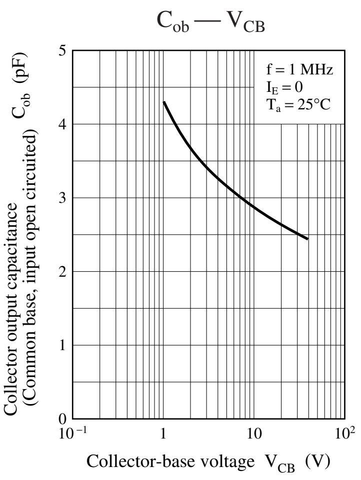

V_{IN} — I_O

Characteristics charts of UNR521M

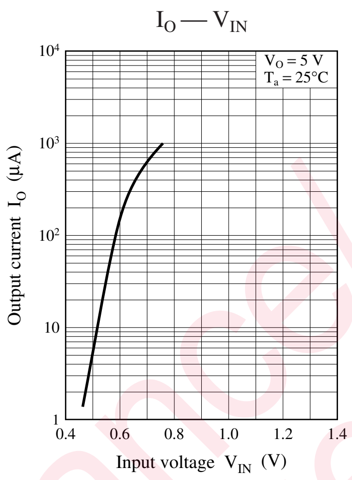

I_C — V_{CE}


$V_{CE(sat)}$ — I_C

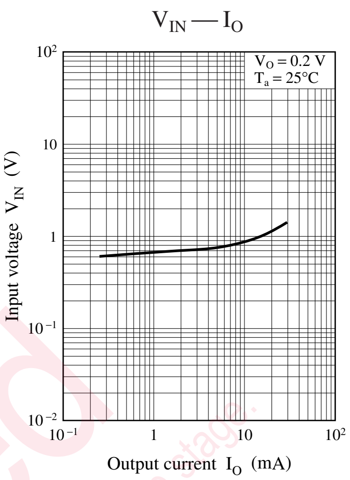

h_{FE} — I_C



C_{ob} — V_{CB}

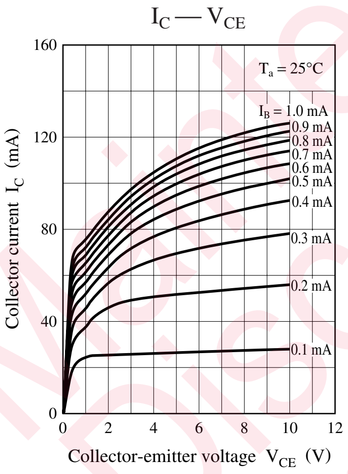


I_O — V_{IN}

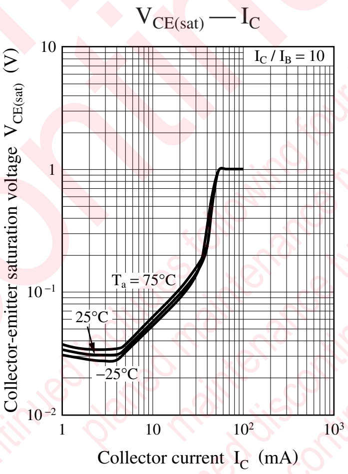


V_{IN} — I_O

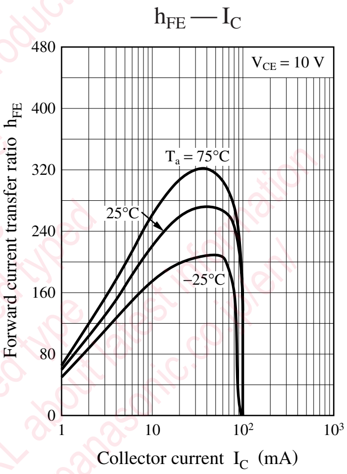
Characteristics charts of UNR521N



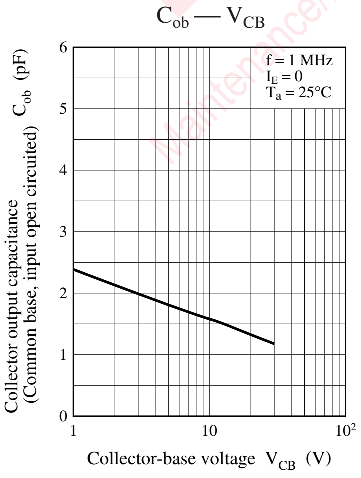
I_C — V_{CE}



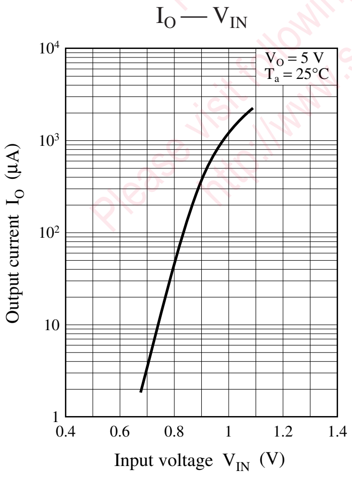
$V_{CE(sat)}$ — I_C



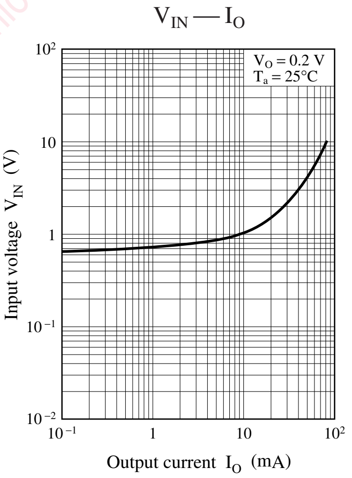
h_{FE} — I_C



C_{ob} — V_{CB}



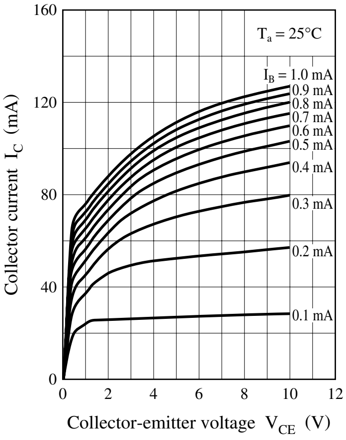
I_O — V_{IN}



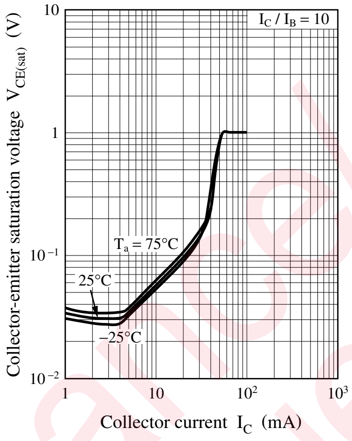
V_{IN} — I_O

Characteristics charts of UNR521T

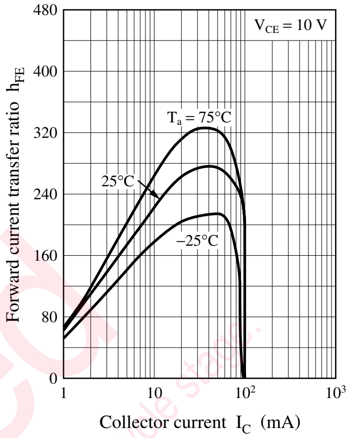
I_C — V_{CE}



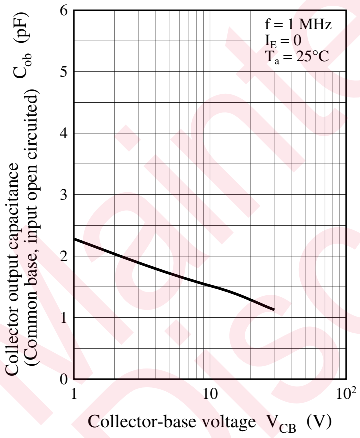
$V_{CE(sat)}$ — I_C



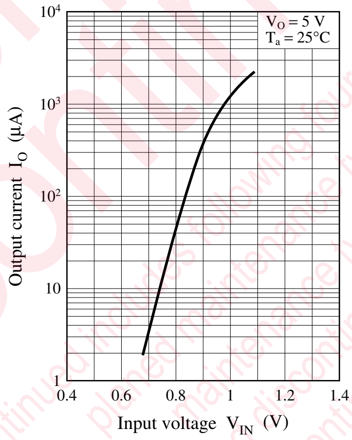
h_{FE} — I_C



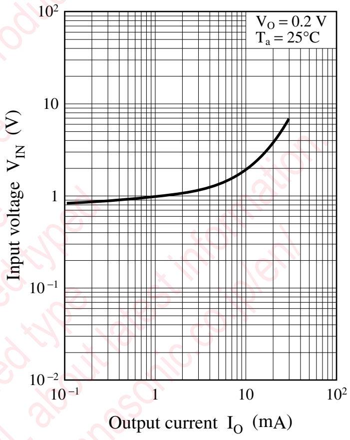
C_{ob} — V_{CB}



I_O — V_{IN}

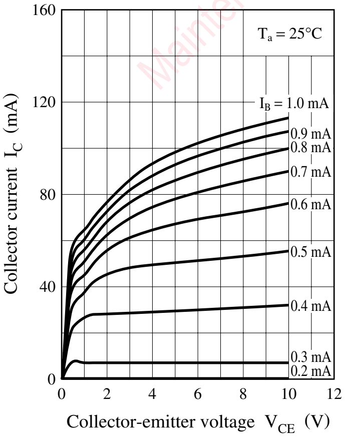


V_{IN} — I_O

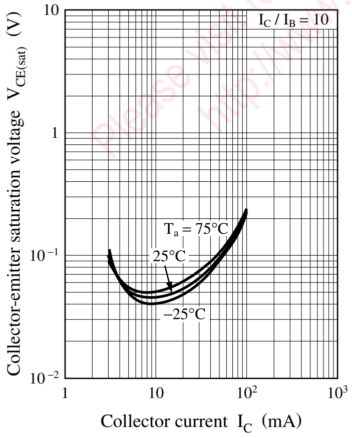


Characteristics charts of UNR521V

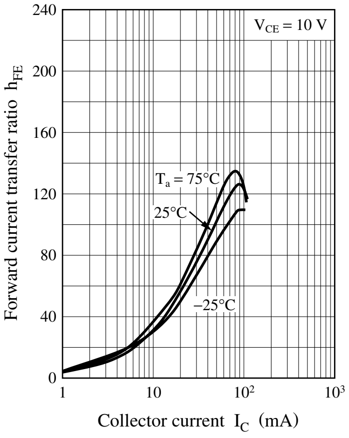
I_C — V_{CE}

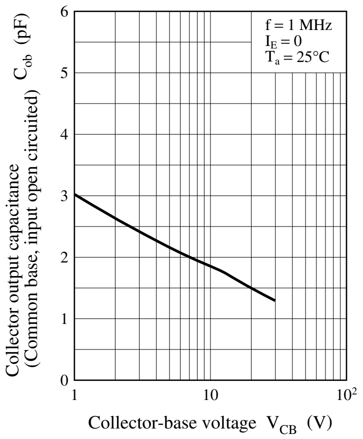


$V_{CE(sat)}$ — I_C

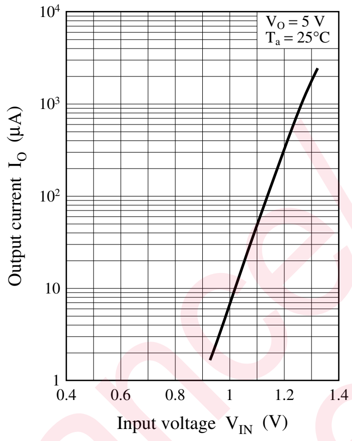


h_{FE} — I_C

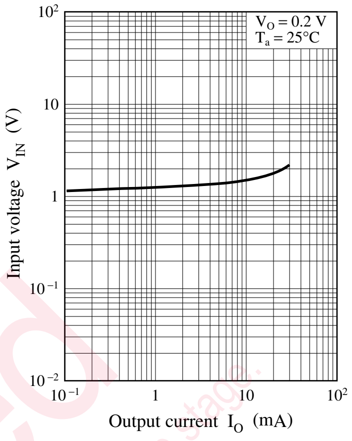




C_{ob} — V_{CB}

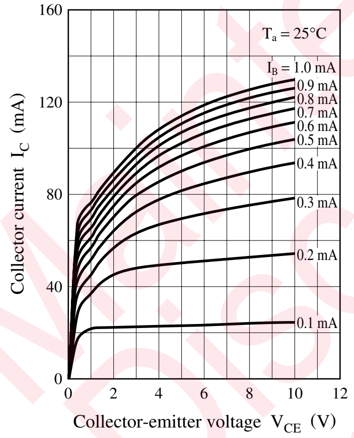


I_O — V_{IN}

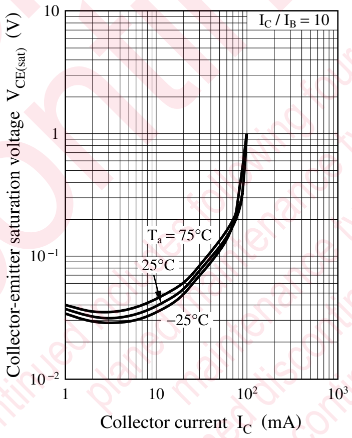


V_{IN} — I_O

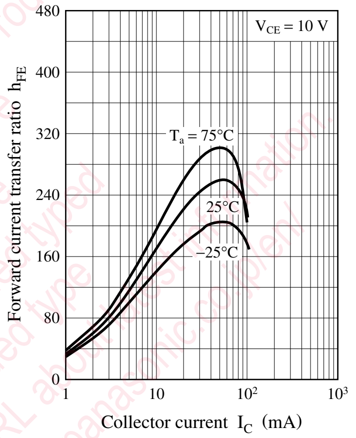
Characteristics charts of UNR521Z



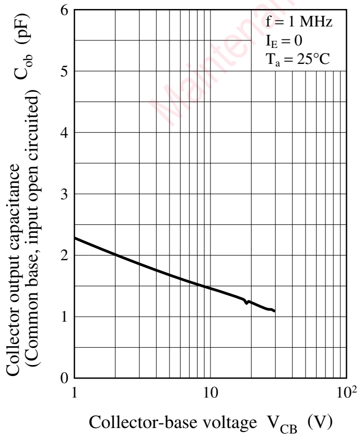
I_C — V_{CE}



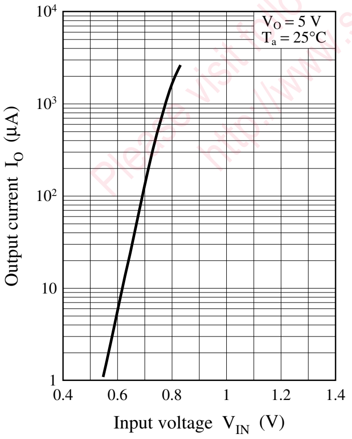
$V_{CE(sat)}$ — I_C



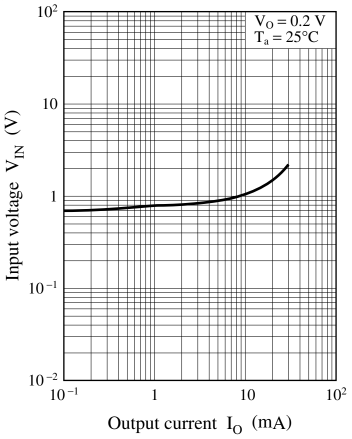
h_{FE} — I_C



C_{ob} — V_{CB}



I_O — V_{IN}



V_{IN} — I_O

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