



**CHENMKO ENTERPRISE CO.,LTD**

**CH3906WPT**

*Lead free devices*

**SURFACE MOUNT  
PNP Switching Transistor**

VOLTAGE 40 Volts CURRENT 0.2 Ampere

**APPLICATION**

- \* Telephony and professional communication equipment.
- \* Other switching applications.

**FEATURE**

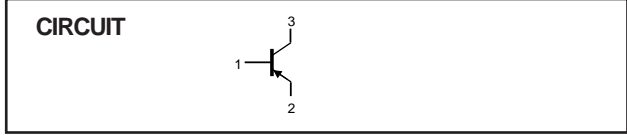
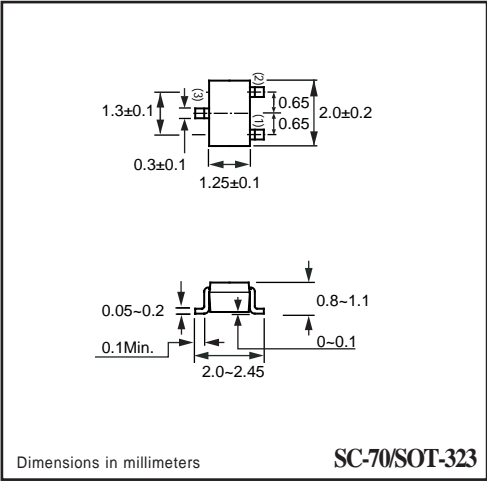
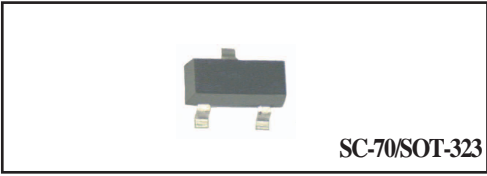
- \* Small surface mounting type. (SC-70/SOT-323)
- \* Low current (Max.=200mA).
- \* Suitable for high packing density.
- \* Low voltage (Max.=40V) .
- \* High saturation current capability.
- \* Voltage controlled small signal switch.

**CONSTRUCTION**

- \* PNP Switching Transistor

**MARKING**

- \* PC



**LIMITING VALUES**

In accordance with the Absolute Maximum Rating System (IEC 60134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V <sub>CB0</sub>	collector-base voltage	open emitter	-	-40	V
V <sub>CEO</sub>	collector-emitter voltage	open base	-	-40	V
V <sub>EB0</sub>	emitter-base voltage	open collector	-	-5	V
I <sub>C</sub>	collector current DC		-	-200	mA
I <sub>CM</sub>	peak collector current		-	-200	mA
I <sub>BM</sub>	peak base current		-	-100	mA
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤ 25 °C; note 1	-	200	mW
T <sub>stg</sub>	storage temperature		-65	+150	°C
T <sub>j</sub>	junction temperature		-	150	°C
T <sub>amb</sub>	operating ambient temperature		-65	+150	°C

**Note**

1. Transistor mounted on an FR4 printed-circuit board.

## RATING CHARACTERISTIC CURVES ( CH3906WPT )

### THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	note 1	500	K/W

#### Note

1. Transistor mounted on an FR4 printed-circuit board.

### CHARACTERISTICS

$T_{amb} = 25\text{ }^{\circ}\text{C}$  unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$I_{CBO}$	collector cut-off current	$I_E = 0; V_{CB} = -30\text{ V}$	–	-50	nA
$I_{EBO}$	emitter cut-off current	$I_C = 0; V_{EB} = 6\text{ V}$	–	-50	nA
$h_{FE}$	DC current gain	$V_{CE} = -1\text{ V}$ ; note 1 $I_C = -0.1\text{ mA}$ $I_C = -1\text{ mA}$ $I_C = -10\text{ mA}$ $I_C = -50\text{ mA}$ $I_C = -100\text{ mA}$	60 80 100 60 30	– – 300 – –	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = -10\text{ mA}; I_B = -1\text{ mA}$	–	-250	mV
		$I_C = -50\text{ mA}; I_B = -5\text{ mA}$	–	-400	mV
$V_{BEsat}$	base-emitter saturation voltage	$I_C = -10\text{ mA}; I_B = -1\text{ mA}$	-650	-850	mV
		$I_C = -50\text{ mA}; I_B = -5\text{ mA}$	–	-950	mV
$C_c$	collector capacitance	$I_E = i_e = 0; V_{CB} = -5\text{ V}; f = 1\text{ MHz}$	–	4.5	pF
$C_e$	emitter capacitance	$I_C = i_c = 0; V_{EB} = -500\text{ mV}; f = 1\text{ MHz}$	–	10	pF
$f_T$	transition frequency	$I_C = 10\text{ mA}; V_{CE} = -20\text{ V}; f = 100\text{ MHz}$	250	–	MHz
F	noise figure	$I_C = 100\text{ }\mu\text{A}; V_{CE} = -5\text{ V}; R_S = 1\text{ k}\Omega; f = 10\text{ Hz to }15.7\text{ kHz}$	–	4	dB

#### Switching times (between 10% and 90% levels);

$t_{on}$	turn-on time	$I_{Con} = -10\text{ mA}; I_{Bon} = -1\text{ mA}; I_{Boff} = 1\text{ mA}$	–	65	ns
$t_d$	delay time		–	35	ns
$t_r$	rise time		–	35	ns
$t_{off}$	turn-off time		–	300	ns
$t_s$	storage time		–	225	ns
$t_f$	fall time		–	75	ns

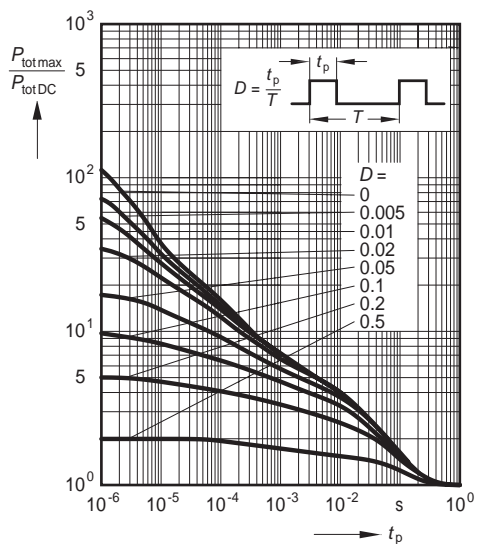
#### Note

1. Pulse test:  $t_p \leq 300\text{ }\mu\text{s}$ ;  $\delta \leq 0.02$ .

## RATING CHARACTERISTIC CURVES ( CH3906WPT )

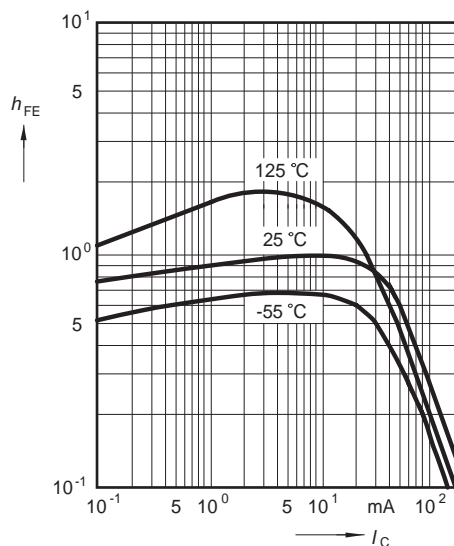
### Permissible Pulse Load

$$P_{\text{totmax}}/P_{\text{totDC}} = f(t_p)$$



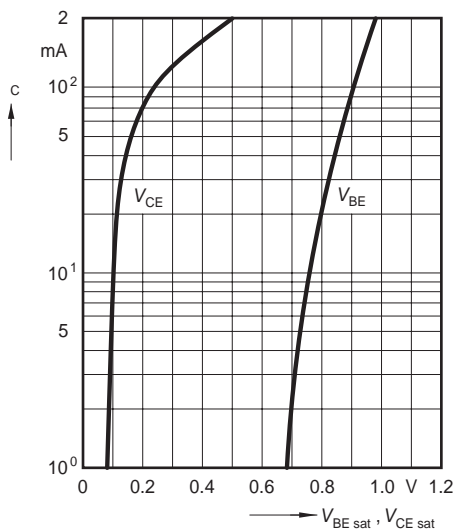
### DC current gain $h_{FE} = f(I_C)$

$$V_{CE} = 1 \text{ V, normalized}$$



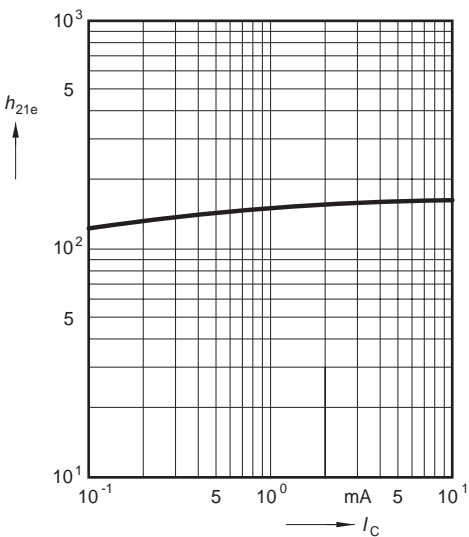
### Saturation voltage $I_C = f(V_{BE\text{sat}}, V_{CE\text{sat}})$

$$h_{FE} = 10$$



### Short-circuit forward current transfer ratio $h_{21e} = f(I_C)$

$$V_{CE} = 10 \text{ V, } f = 1 \text{ MHz}$$

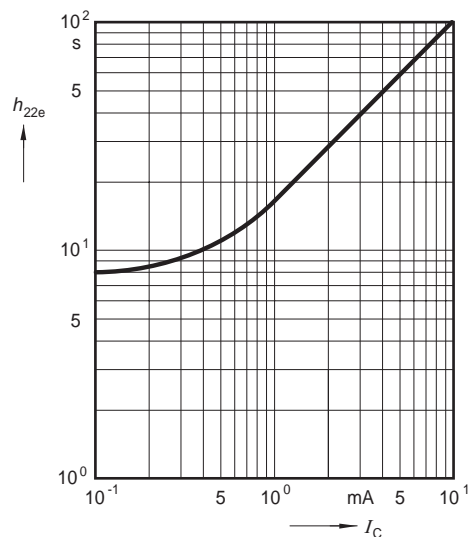


## RATING CHARACTERISTIC CURVES ( CH3906WPT )

### Open-circuit output admittance

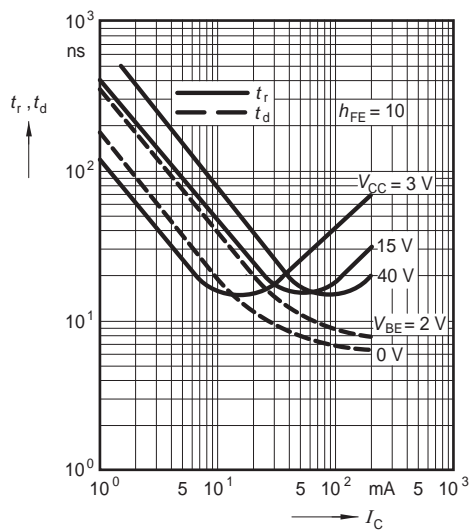
$$h_{22e} = f(I_C)$$

$V_{CE} = 10V, f = 1MHz$

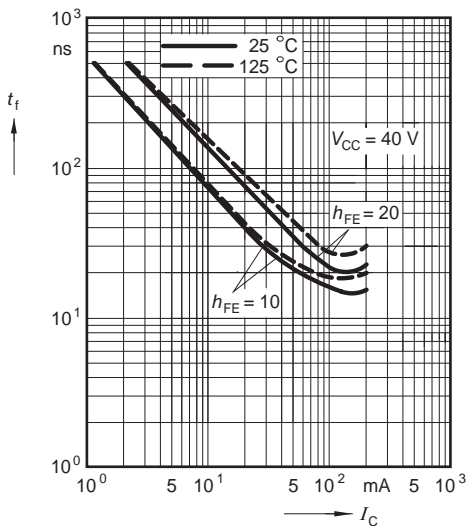


### Delay time $t_d = f(I_C)$

### Rise time $t_r = f(I_C)$



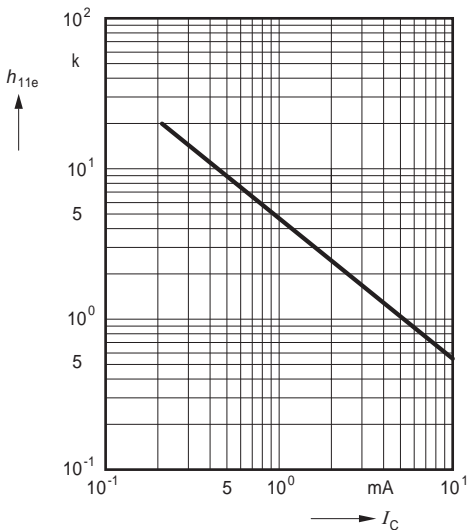
### Fall time $t_f = f(I_C)$



### Input impedance

$$h_{11e} = f(I_C)$$

$V_{CE} = 10V, f = 1kHz$

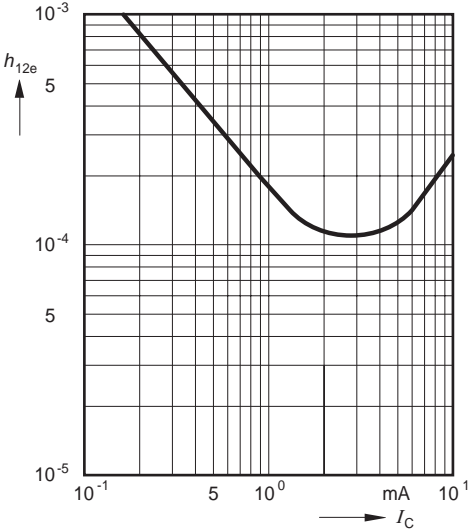


**RATING CHARACTERISTIC CURVES ( CH3906WPT )**

**Open-circuit reverse voltage**

**transfer ratio  $h_{12e} = f(I_C)$**

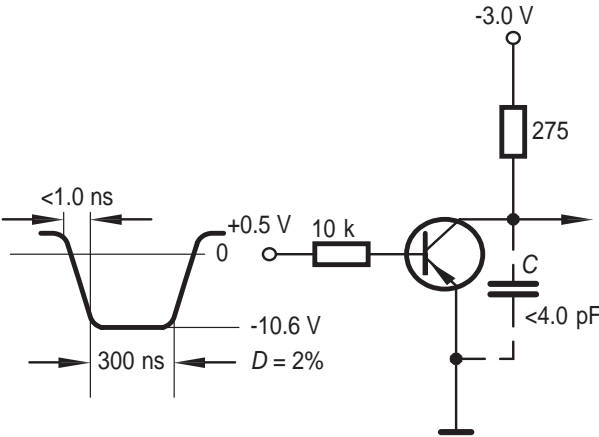
$V_{CE} = 10V, f = 1kHz$



# RATING CHARACTERISTIC CURVES ( CH3906WPT )

## Test circuit

### Delay and rise time



### Storage and fall time

