

TOSHIBA TRANSISTOR

SILICON NPN EPITAXIAL TYPE (PCT PROCESS)

2N3904

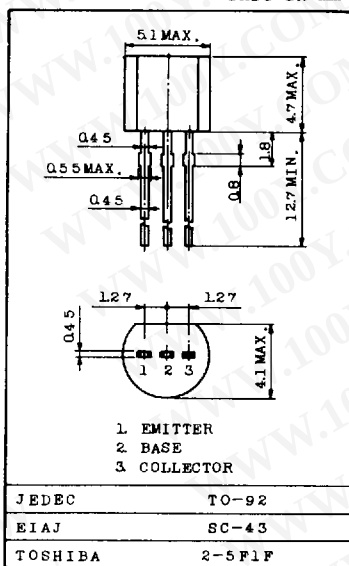
TOSHIBA (DISCRETE/OPTO)

FOR GENERAL PURPOSE USE SWITCHING AND AMPLIFIER APPLICATIONS.

FEATURES:

- Low Leakage Current
: $I_{CEV}=50\text{nA}(\text{Max.})$, $I_{BEV}=-50\text{nA}(\text{Max.})$
@ $V_{CE}=30\text{V}$, $V_{BE}=-3\text{V}$
- Excellent DC Current Gain Linearity
- Low Saturation Voltage
: $V_{CE}(\text{sat})=0.3\text{V}(\text{Max.})$ @ $I_C=50\text{mA}$, $I_B=5\text{mA}$
- Low Collector Output Capacitance
: $C_{ob}=4\text{pF}(\text{Max.})$ @ $V_{CB}=5\text{V}$
- Complementary to 2N3906

Unit in mm

MAXIMUM RATINGS ($T_a=25^\circ\text{C}$)

Weight : 0.21g

CHARACTERISTIC	SYMBOL	RATING	UNIT
* Collector-Base Voltage	V_{CBO}	60	V
* Collector-Emitter Voltage	V_{CEO}	40	V
* Emitter-Base Voltage	V_{EBO}	6	V
* Collector Current	I_C	200	mA
Base Current	I_B	50	mA
* Collector Power Dissipation ($T_a=25^\circ\text{C}$) Derate Linearly 25°C	P_C	625	mW
		5.0	mW/ $^\circ\text{C}$
* Collector Power Dissipation ($T_c=25^\circ\text{C}$) Derate Linearly 25°C	P_C	1.5	W
		12	mW/ $^\circ\text{C}$
* Thermal Resistance (Junction to Ambient)	$R_{th(j-a)}$	200	$^\circ\text{C/W}$
* Thermal Resistance (Junction to Case)	$R_{th(j-c)}$	83.3	$^\circ\text{C/W}$
* Junction Temperature	T_j	150	$^\circ\text{C}$
* Storage Temperature Range	T_{stg}	-55~150	$^\circ\text{C}$

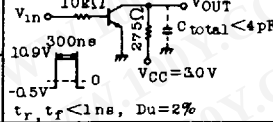
*In accordance with JEDEC registration data.

勝特力材料 886-3-5753170
 勝特力电子(上海) 86-21-34970699
 勝特力电子(深圳) 86-755-83298787
[Http://www.100y.com.tw](http://www.100y.com.tw)

TOSHIBA (DISCRETE/OPTO)

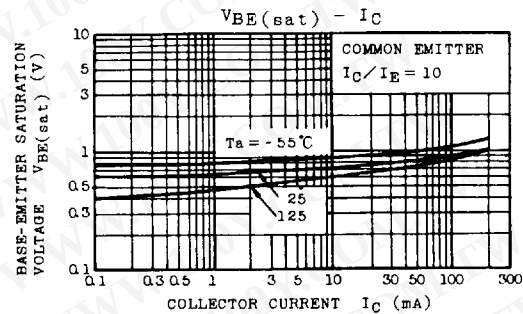
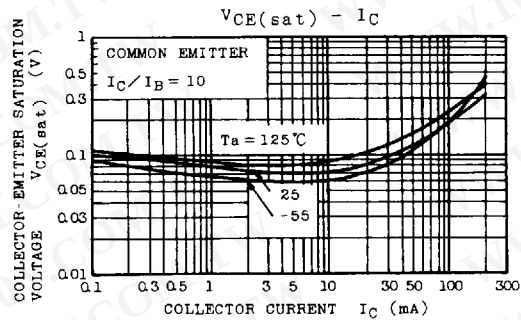
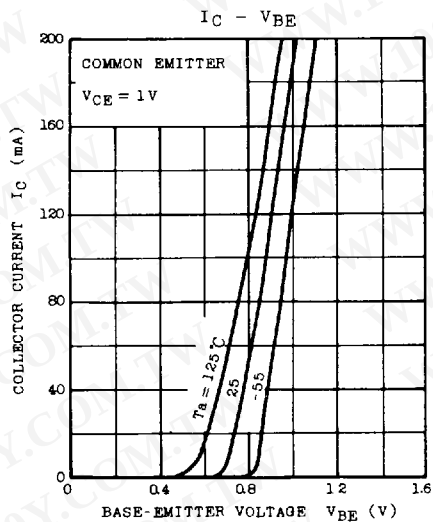
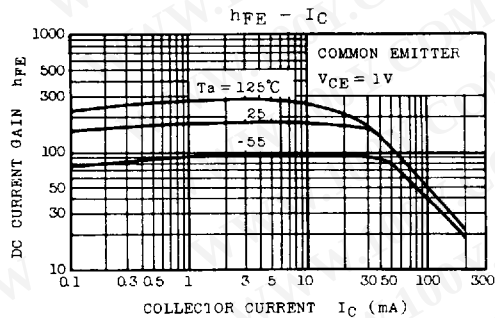
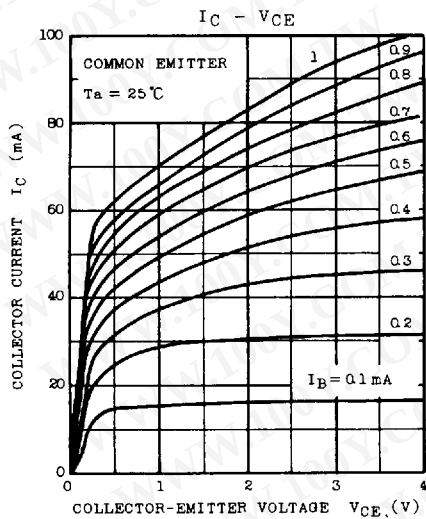
2N3904

ELECTRICAL CHARACTERISTICS (Ta=25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
* Collector Cut-off Current		ICEV	VCE=30V, VBE=-3V	-	-	50	nA
* Base Cut-off Current		IBEV	VCE=30V, VBE=-3V	-	-	-50	nA
* Collector-Base Breakdown Voltage		V(BR)CBO	IC=10μA, IE=0	60	-	-	V
* Collector-Emitter Breakdown Voltage		V(BR)CEO	IC=1mA, IB=0	40	-	-	V
* Emitter-Base Breakdown Voltage		V(BR)EBO	IE=10μA, IC=0	6	-	-	V
* DC Current Gain		hFE(1)	VCE=1V, IC=0.1mA	40	-	-	
		hFE(2)	VCE=1V, IC=1mA	70	-	-	
		hFE(3)	VCE=1V, IC=10mA	100	-	300	
		hFE(4)	VCE=1V, IC=50mA	60	-	-	
		hFE(5)	VCE=1V, IC=100mA	30	-	-	
* Collector-Emitter Saturation Voltage		VCE(sat)1	IC=10mA, IB=1mA	-	-	0.2	V
		VCE(sat)2	IC=50mA, IB=5mA	-	-	0.3	
* Base-Emitter Saturation Voltage		VBE(sat)1	IC=10mA, IB=1mA	0.65	-	0.85	V
		VBE(sat)2	IC=50mA, IB=5mA	-	-	0.95	
* Transition Frequency		fT	VCE=20V, IC=10mA f=100MHz	300	-	-	MHz
* Collector Output Capacitance		Cob	VCE=5V, IE=0, f=1MHz	-	-	4	pF
* Input Capacitance		Cib	VEB=0.5V, IC=0, f=1MHz	-	-	8	pF
* Input Impedance		hie	VCE=10V, IC=1mA f=1kHz	1.0	-	10	kΩ
* Voltage Feedback Ratio		hre		0.5	-	8	×10 ⁻⁴
* Small-Signal Current Gain		hfe		100	-	400	
* Collector Output Admittance		hoe		1.0	-	40	μS
* Noise Figure		NF	VCE=5V, IC=0.1mA Rg=1kΩ, f=10Hz ~ 15.7kHz	-	-	5	dB
* Switching Time	Delay Time	td		-	-	35	ns
	Rise Time	tr		-	-	35	
	Storage Time	tstg		-	-	200	
	Fall Time	tf		-	-	50	

* In accordance with JEDEC registration data.

TOSHIBA (DISCRETE/OPTO)



TOSHIBA (DISCRETE/OPTO)

2N3904

