

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE (PCT PROCESS)

# 2SC2669

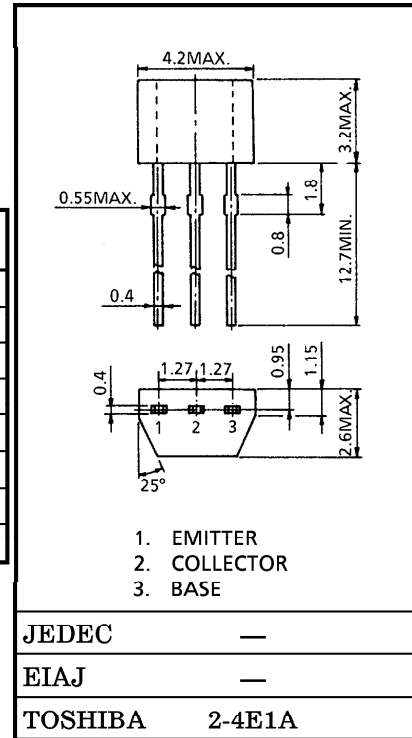
HIGH FREQUENCY AMPLIFIER APPLICATIONS

Unit in mm

- High Power Gain :  $G_{pe} = 30\text{dB}$  (Typ.) ( $f = 10.7\text{MHz}$ )
- Recommended for FM IF, OSC Stage and AM CONV, IF Stage.

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

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	$V_{CB0}$	35	V
Collector-Emitter Voltage	$V_{CE0}$	30	V
Emitter-Base Voltage	$V_{EB0}$	4	V
Collector Current	$I_C$	50	mA
Base Current	$I_B$	10	mA
Collector Power Dissipation	$P_C$	200	mW
Junction Temperature	$T_j$	125	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-55~125	$^\circ\text{C}$



Weight : 0.13g

ELECTRICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	$I_{CBO}$	$V_{CB} = 35\text{V}, I_E = 0$	—	—	0.1	$\mu\text{A}$
Emitter Cut-off Current	$I_{EBO}$	$V_{EB} = 4\text{V}, I_C = 0$	—	—	1.0	$\mu\text{A}$
DC Current Gain	$h_{FE}$ (Note)	$V_{CE} = 12\text{V}, I_C = 2\text{mA}$	40	—	240	—
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 10\text{mA}, I_B = 1\text{mA}$	—	—	0.4	V
Base-Emitter Voltage	$V_{BE}$	$I_C = 10\text{mA}, I_B = 1\text{mA}$	—	—	1.0	V
Transition Frequency	$f_T$	$V_{CE} = 10\text{V}, I_C = 1\text{mA}$	100	—	—	MHz
Collector Output Capacitance	$C_{ob}$	$V_{CB} = 10\text{V}, I_E = 0, f = 1\text{MHz}$	—	2.0	3.2	pF
Collector-Base Time Constant	$C_c, r_{bb'}$	$V_{CE} = 10\text{V}, I_E = -1\text{mA}, f = 30\text{MHz}$	—	—	50	ps
Power Gain	$G_{pe}$	$V_{CC} = 6\text{V}, I_E = -1\text{mA}, f = 10.7\text{MHz}$ (Fig.)	27	30	33	dB

Note :  $h_{FE}$  Classification R : 40~80, O : 70~140, Y : 120~240

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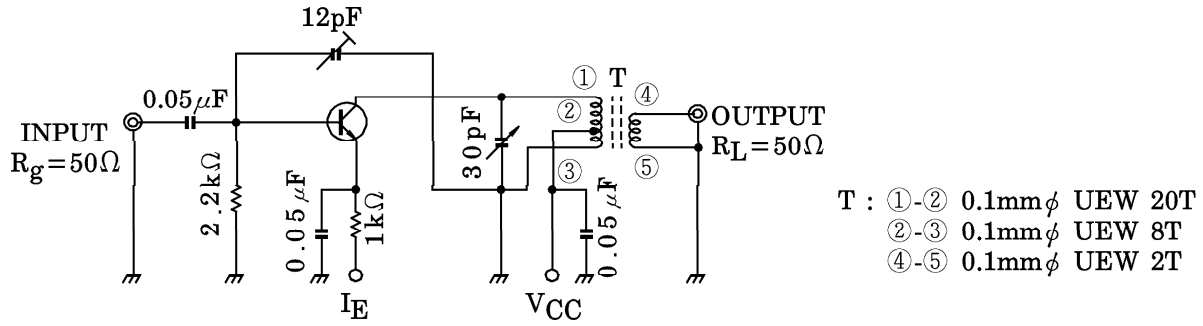


Fig.1 G<sub>pe</sub> TEST CIRCUIT

Y PARAMETERS (Typ.)

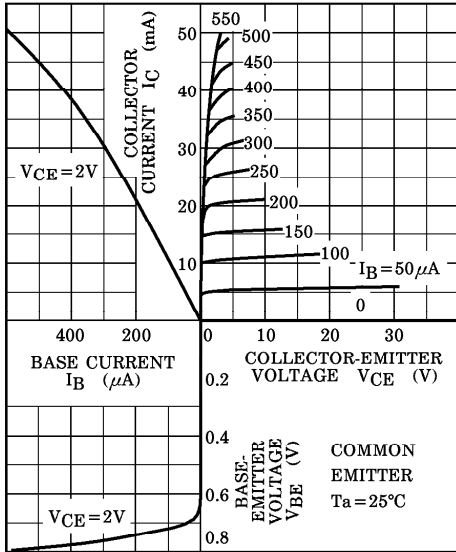
(1) (COMMON EMITTER f = 455kHz, T<sub>a</sub> = 25°C)

CHARACTERISTIC	SYMBOL	2SC2669-R	2SC2669-O	2SC2669-Y	UNIT
Collector-Emitter Voltage	V <sub>CE</sub>	6	6	6	V
Emitter Current	I <sub>E</sub>	-1	-1	-1	mA
Input Conductance	g <sub>ie</sub>	0.58	0.41	0.26	mS
Input Capacitance	C <sub>ie</sub>	53	46	38	pF
Output Conductance	g <sub>oe</sub>	1.9	2.7	4.8	μS
Output Capacitance	C <sub>oe</sub>	2.6	2.8	3.6	pF
Forward Transfer Admittance	y <sub>fe</sub>	38	38	38	mS
Phase Angle of Forward Transfer Admittance	θ <sub>fe</sub>	-0.79	-0.83	-0.92	°
Reverse Transfer Admittance	y <sub>re</sub>	5.7	5.7	6.2	μS
Phase Angle of Reverse Transfer Admittance	θ <sub>re</sub>	-90	-90	-90	°

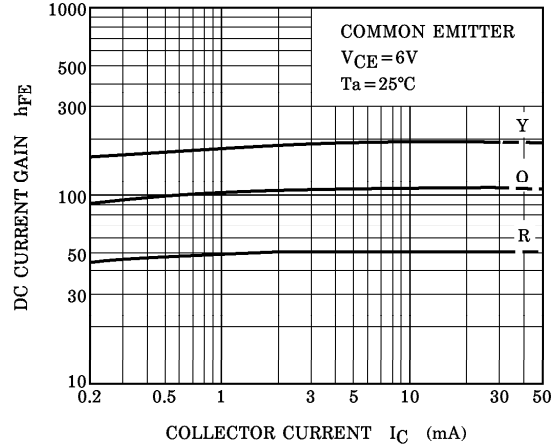
(2) (COMMON EMITTER f = 10.7MHz, T<sub>a</sub> = 25°C)

CHARACTERISTIC	SYMBOL	2SC2669-R	2SC2669-O	2SC2669-Y	UNIT
Collector-Emitter Voltage	V <sub>CE</sub>	6	6	6	V
Emitter Current	I <sub>E</sub>	-1	-1	-1	mA
Input Conductance	g <sub>ie</sub>	1.04	0.85	0.65	mS
Input Capacitance	C <sub>ie</sub>	49	43	36	pF
Output Conductance	g <sub>oe</sub>	10	15	28	μS
Output Capacitance	C <sub>oe</sub>	2.7	2.9	3.6	pF
Forward Transfer Admittance	y <sub>fe</sub>	37	37	37	mS
Phase Angle of Forward Transfer Admittance	θ <sub>fe</sub>	-9.6	-10.4	-11.5	°
Reverse Transfer Admittance	y <sub>re</sub>	120	120	140	μS
Phase Angle of Reverse Transfer Admittance	θ <sub>re</sub>	-90	-90	-90	°

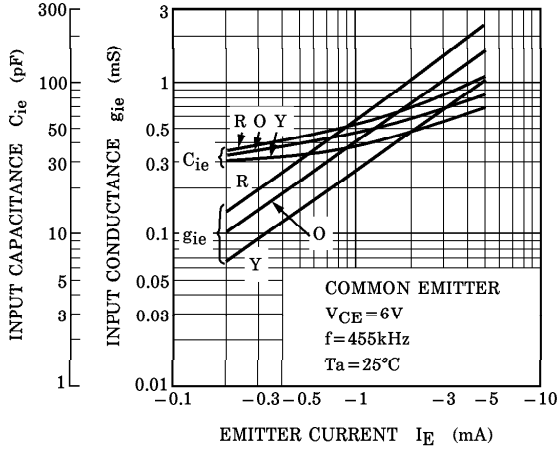
STATIC CHARACTERISTICS



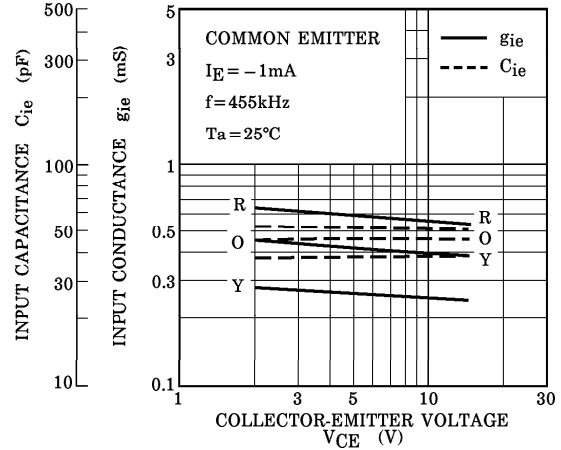
$h_{FE} - I_C$

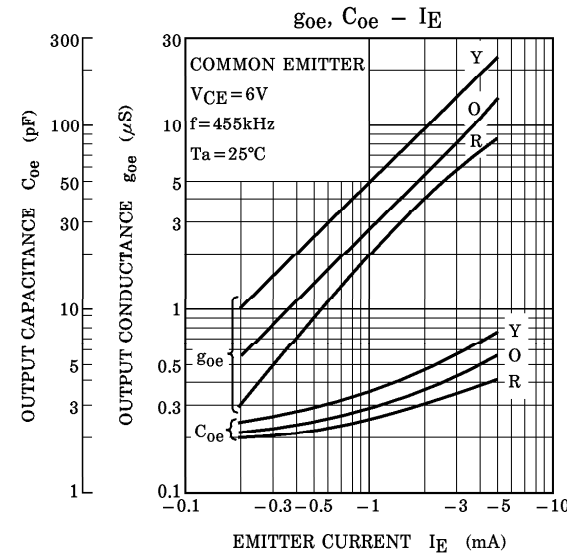
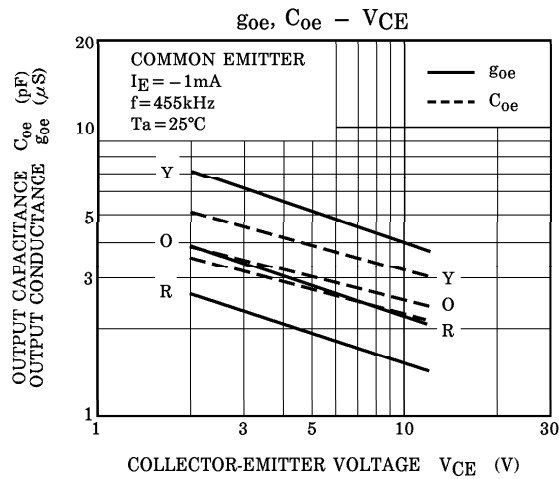
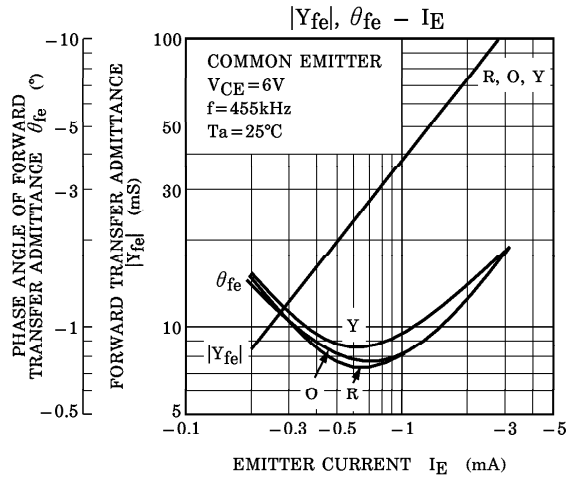
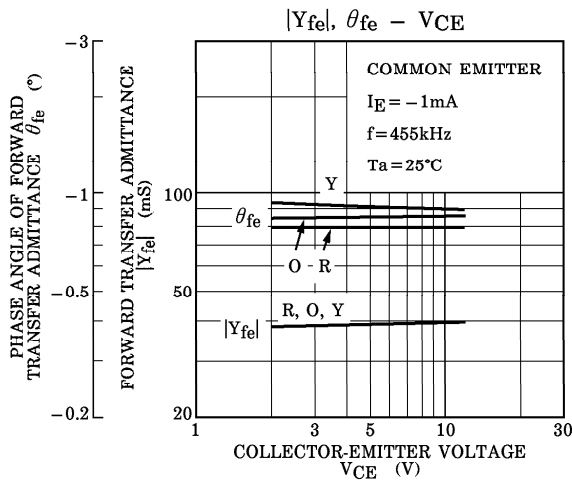
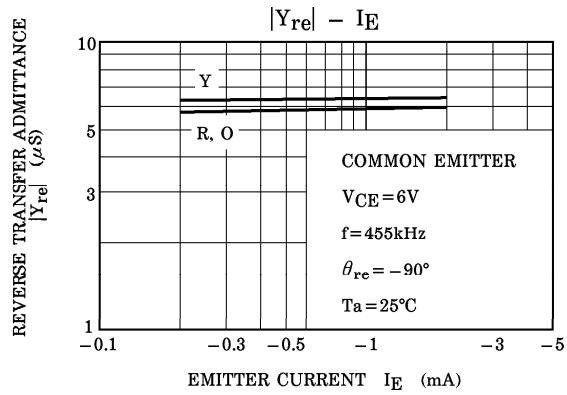
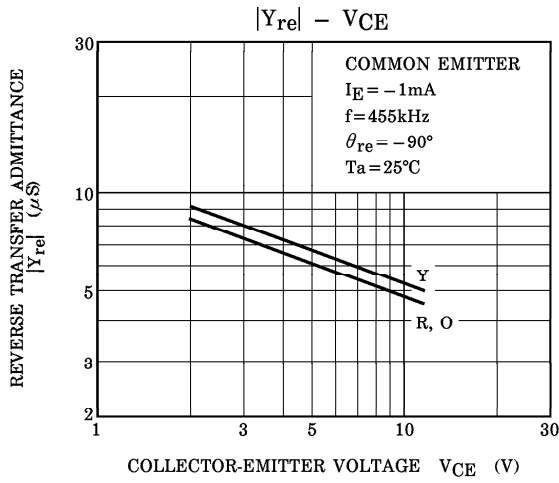


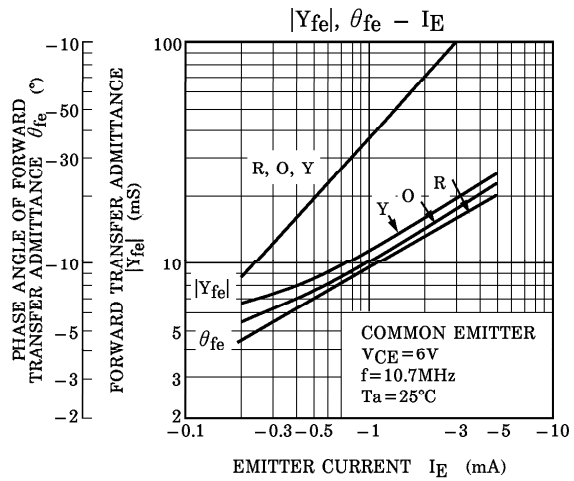
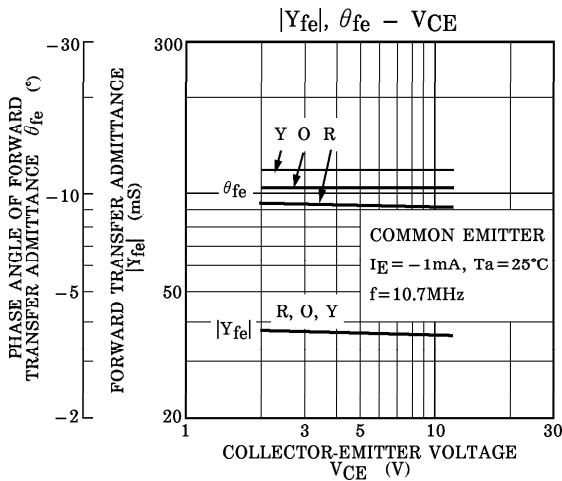
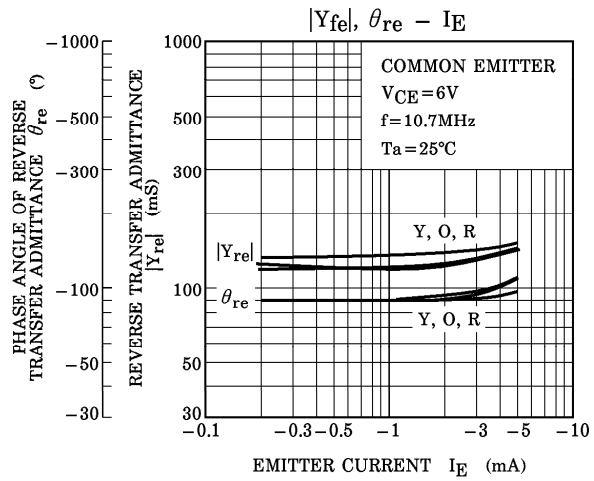
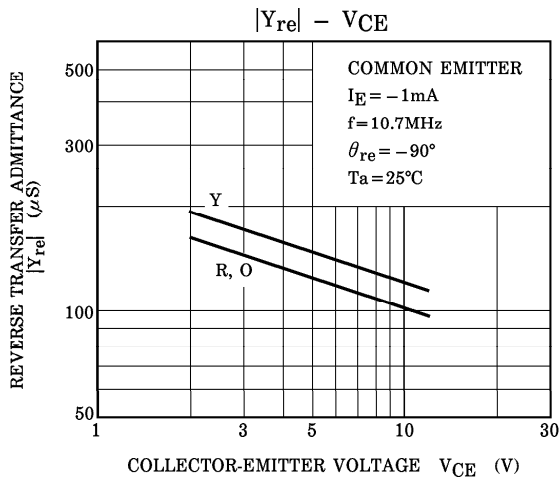
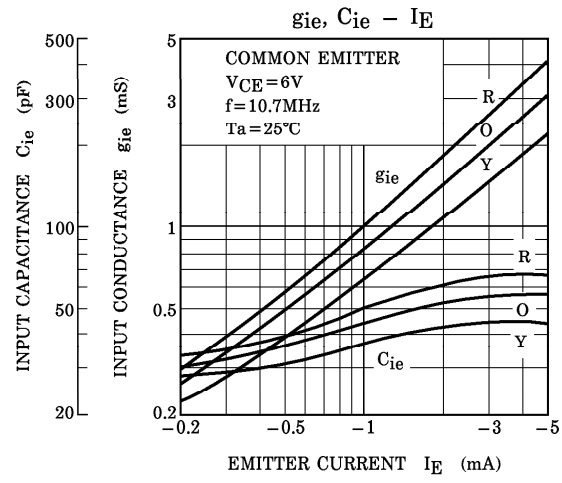
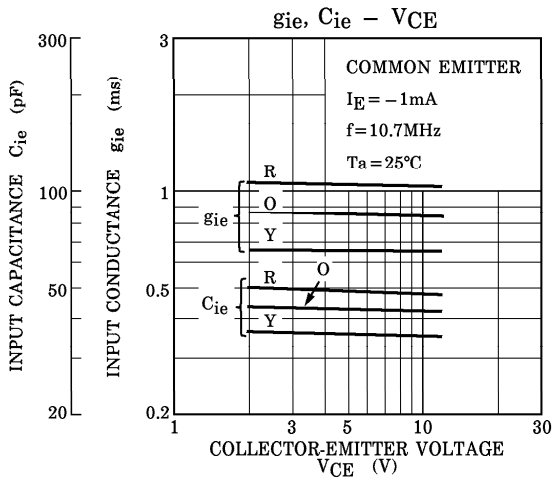
$g_{ie}, C_{ie} - I_E$

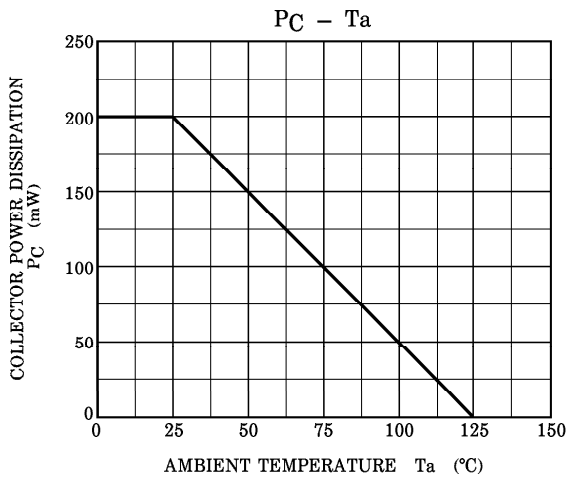
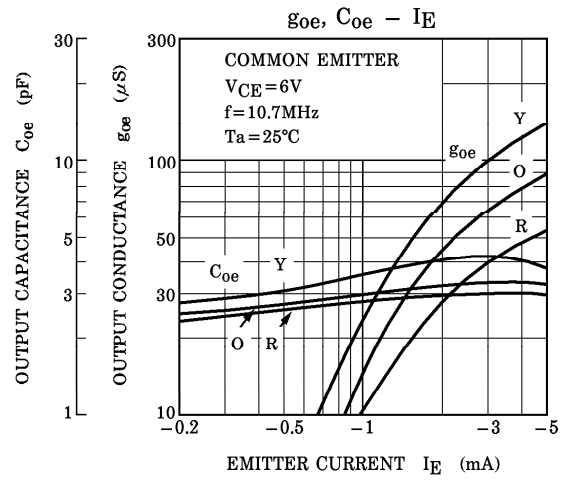
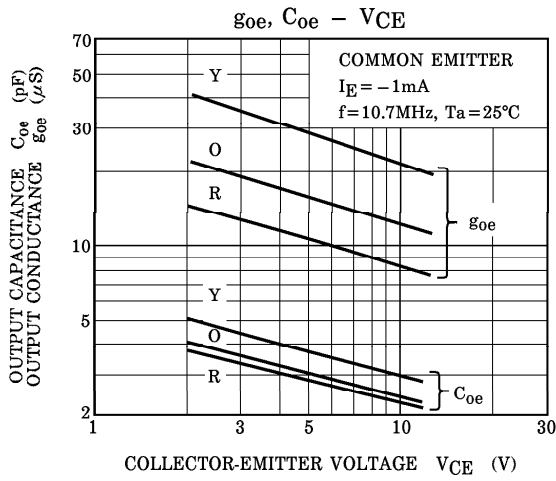


$g_{ie}, C_{ie} - V_{CE}$









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