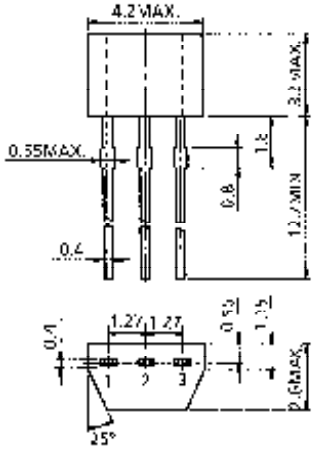
TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE (PCT PROCESS)

2SC2669

HIGH FREQUENCY AMPLIFIER APPLICATIONS

Unit in mm

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



1. EMITTER
2. COLLECTOR
3. BASE

JEDEC	—
EIAJ	—
TOSHIBA	2-4E1A

Weight : 0.13g

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V_{CBO}	35	V
Collector-Emitter Voltage	V_{CEO}	30	V
Emitter-Base Voltage	V_{EBO}	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	°C
Storage Temperature Range	T_{stg}	−55~125	°C

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

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

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

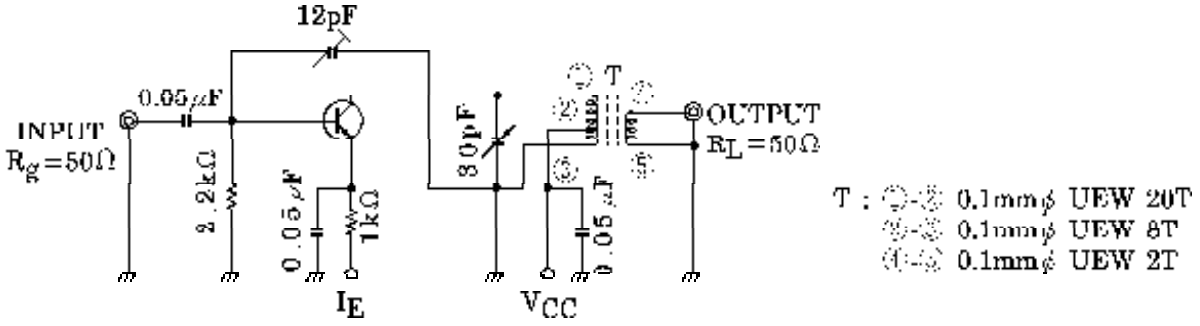


Fig.1 G_{pe} TEST CIRCUIT

Y PARAMETERS (Typ.)

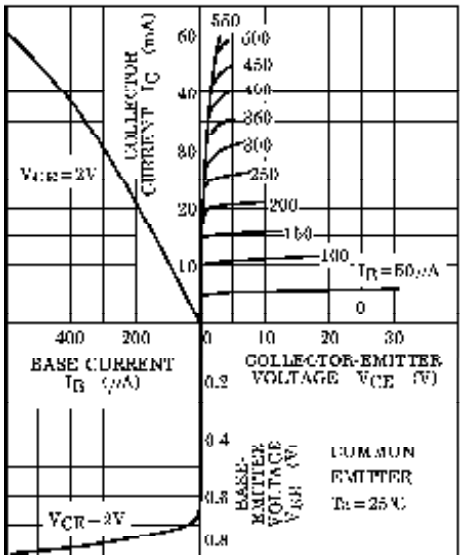
(1) (COMMON EMITTER f = 455kHz, Ta = 25°C)

CHARACTERISTIC	SYMBOL	2SC2669-R	2SC2669-O	2SC2669-Y	UNIT
Collector-Emitter Voltage	V_{CE}	6	6	6	V
Emitter Current	I_E	−1	−1	−1	mA
Input Conductance	g_{ie}	0.58	0.41	0.26	mS
Input Capacitance	C_{ie}	53	46	38	pF
Output Conductance	g_{oe}	1.9	2.7	4.8	μS
Output Capacitance	C_{oe}	2.6	2.8	3.6	pF
Forward Transfer Admittance	$\|y_{fe}\|$	38	38	38	mS
Phase Angle of Forward Transfer Admittance	θ_{fe}	−0.79	−0.83	−0.92	°
Reverse Transfer Admittance	$\|y_{re}\|$	5.7	5.7	6.2	μS
Phase Angle of Reverse Transfer Admittance	θ_{re}	−90	−90	−90	°

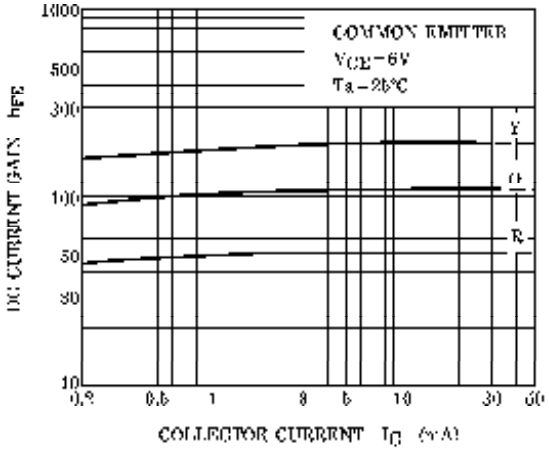
(2) (COMMON EMITTER f = 10.7MHz, Ta = 25°C)

CHARACTERISTIC	SYMBOL	2SC2669-R	2SC2669-O	2SC2669-Y	UNIT
Collector-Emitter Voltage	V_{CE}	6	6	6	V
Emitter Current	I_E	−1	−1	−1	mA
Input Conductance	g_{ie}	1.04	0.85	0.65	mS
Input Capacitance	C_{ie}	49	43	36	pF
Output Conductance	g_{oe}	10	15	28	μS
Output Capacitance	C_{oe}	2.7	2.9	3.6	pF
Forward Transfer Admittance	$\|y_{fe}\|$	37	37	37	mS
Phase Angle of Forward Transfer Admittance	θ_{fe}	−9.6	−10.4	−11.5	°
Reverse Transfer Admittance	$\|y_{re}\|$	120	120	140	μS
Phase Angle of Reverse Transfer Admittance	θ_{re}	−90	−90	−90	°

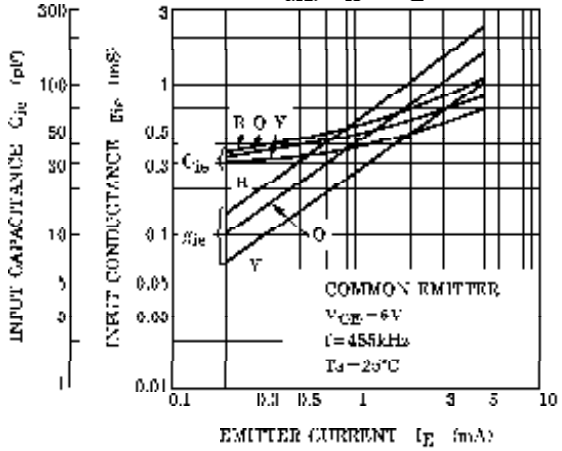
STATIC CHARACTERISTICS



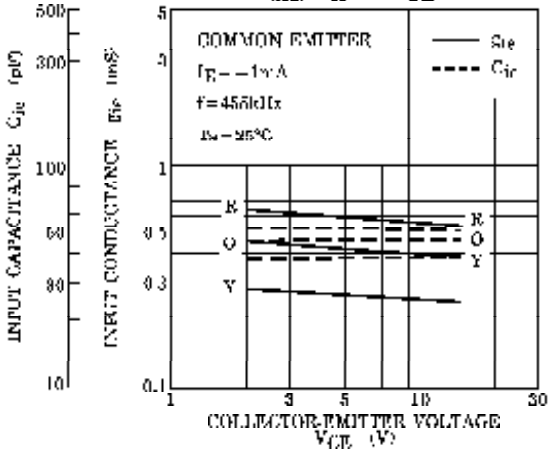
h_{FE} – I_C



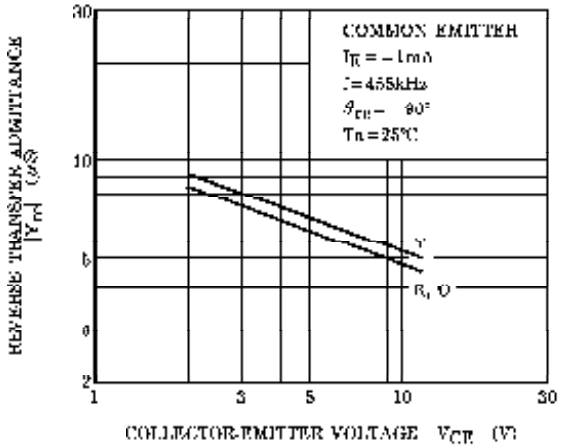
$|y_{ie}|$, C_{ie} – I_E



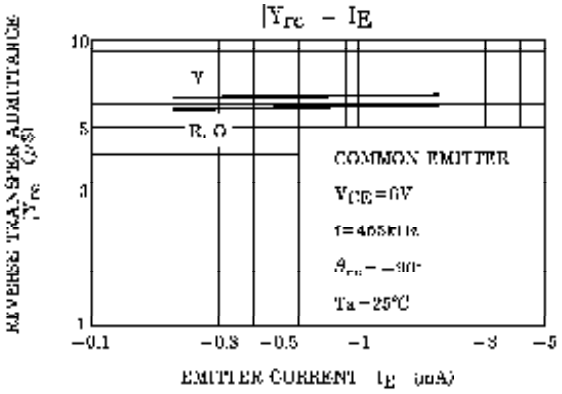
$|y_{ie}|$, C_{ie} – V_{CE}



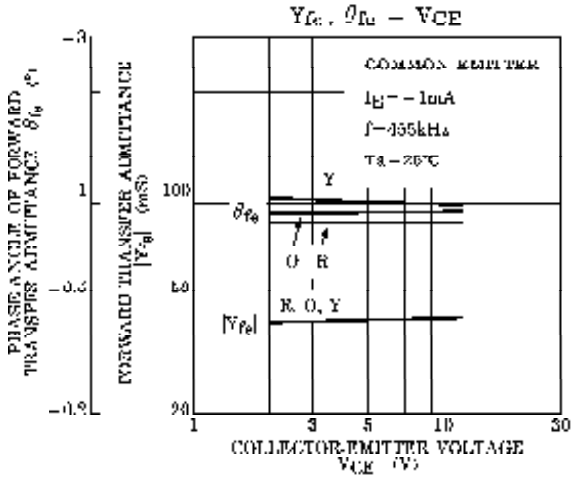
$|Y_{re}|$ – V_{CE}



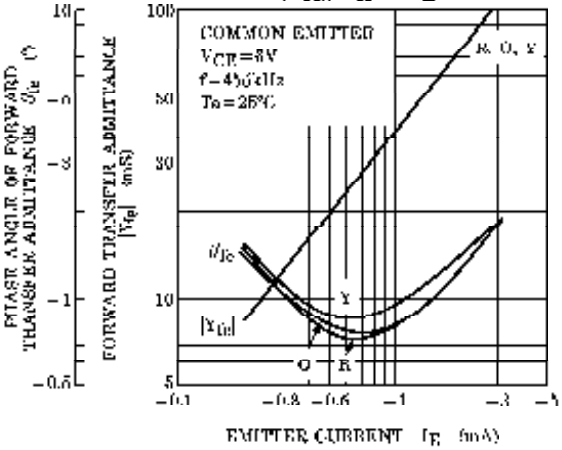
$|Y_{re}|$ – I_E



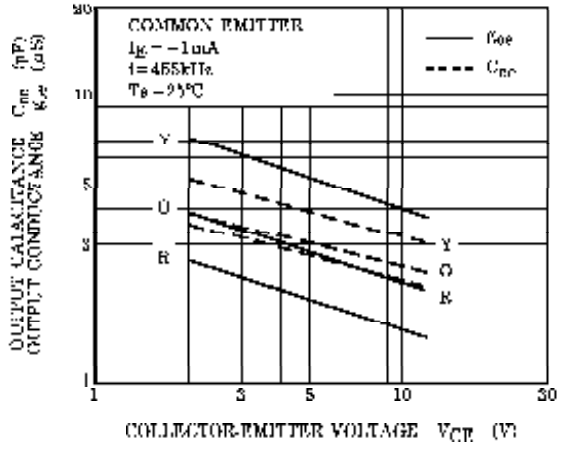
Y_{fe}, θ_{fe} – V_{CE}



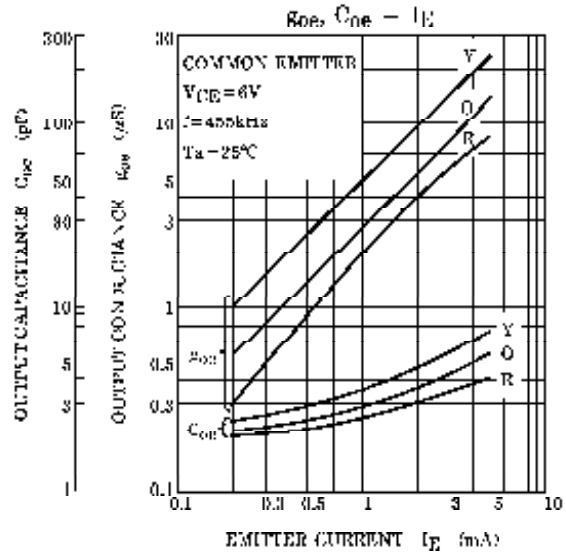
$|Y_{fe}|$, θ_{fe} – I_E

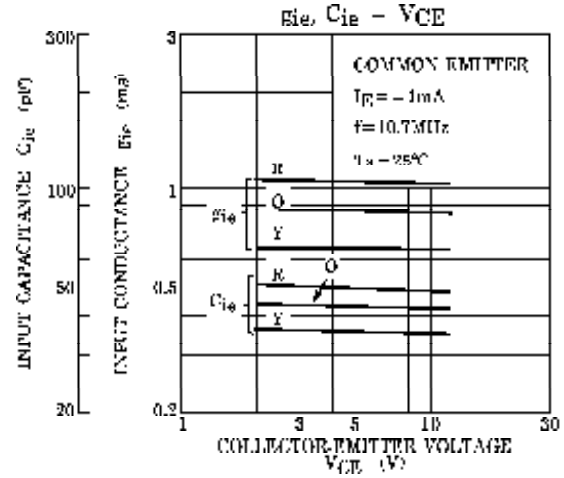


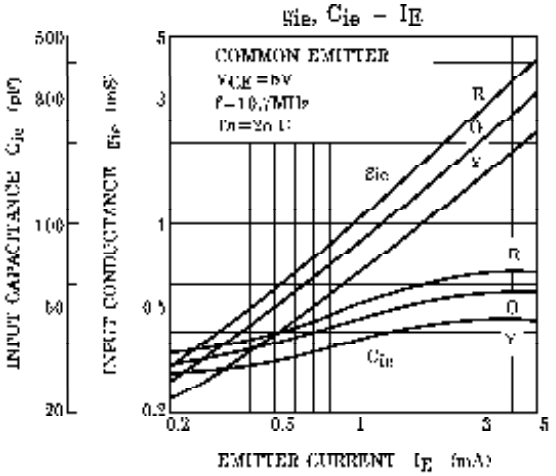
g_{oe}, C_{oe} – V_{CE}

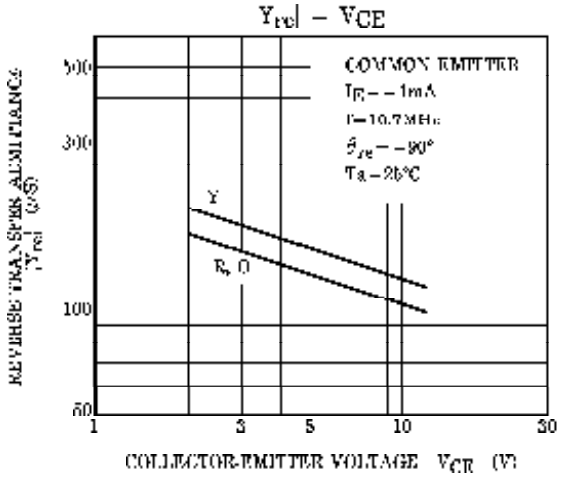


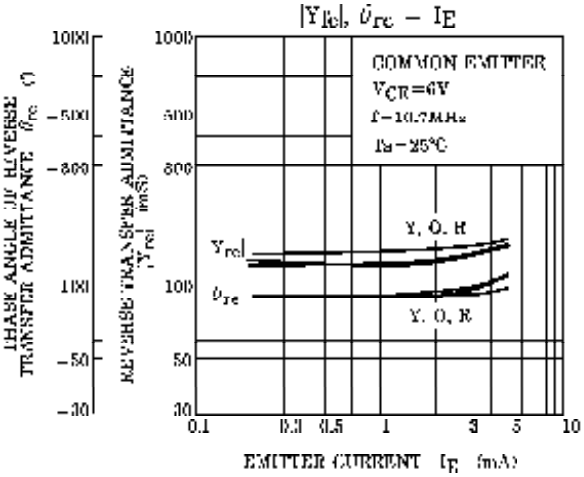
g_{oe}, C_{oe} – I_E

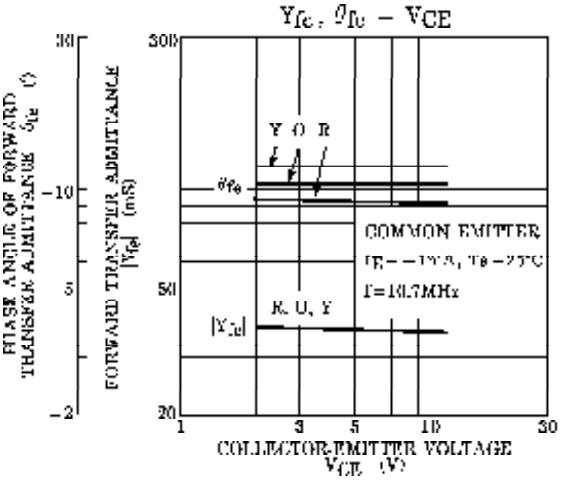


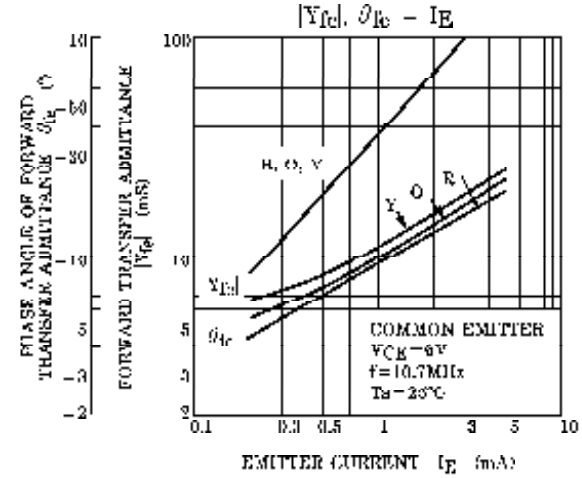

gie, Cie – VCE
COMMON EMITTER
IE = −1mA
f = 10.7MHz
Ta = 25°C
INPUT CAPACITANCE Cie (pF)
INPUT CONDUCTANCE gie (mS)
COLLECTOR-EMITTER VOLTAGE VCE (V)

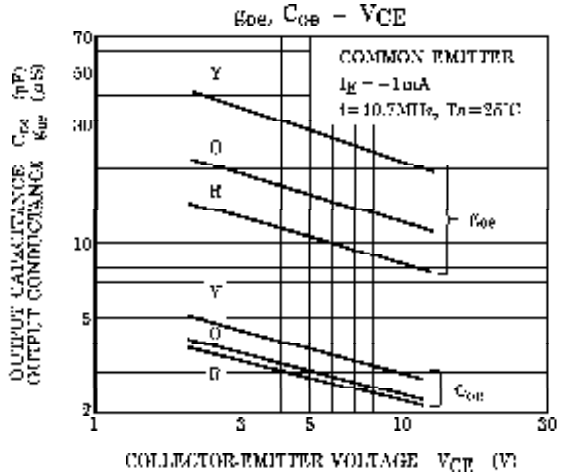

gie, Cie – IE
COMMON EMITTER
VCE = 6V
f = 10.7MHz
Ta = 25°C
INPUT CAPACITANCE Cie (pF)
INPUT CONDUCTANCE gie (mS)
EMITTER CURRENT IE (mA)

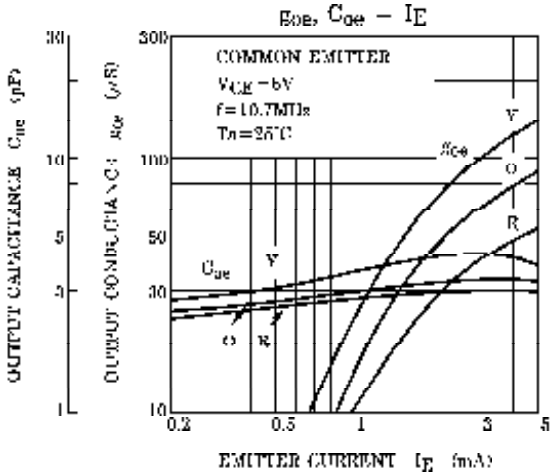

|Yre| – VCE
COMMON EMITTER
IE = −1mA
f = 10.7MHz
θre = −90°
Ta = 25°C
REVERSE TRANSFER ADMITTANCE |Yre| (mS)
COLLECTOR-EMITTER VOLTAGE VCR (V)

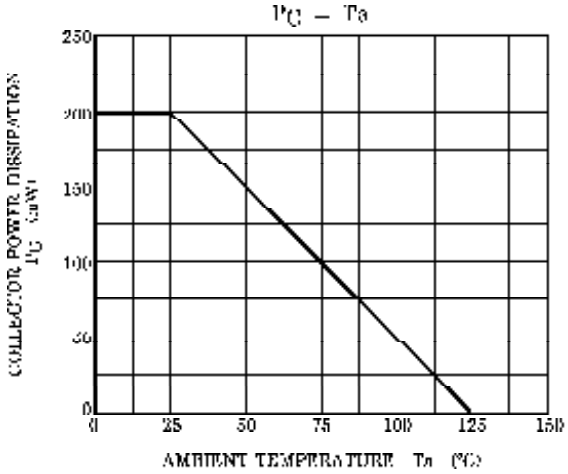

|Yre|, θre – IE
COMMON EMITTER
VCR = 6V
f = 10.7MHz
Ta = 25°C
PHASE ANGLE OF REVERSE TRANSFER ADMITTANCE θre (°)
REVERSE TRANSFER ADMITTANCE |Yre| (mS)
EMITTER CURRENT IE (mA)


Yfe, θfe – VCE
COMMON EMITTER
IE = −1mA, Ta = 25°C
f = 10.7MHz
PHASE ANGLE OF FORWARD TRANSFER ADMITTANCE θfe (°)
FORWARD TRANSFER ADMITTANCE |Yfe| (mS)
COLLECTOR-EMITTER VOLTAGE VCE (V)


|Yfe|, θfe – IE
COMMON EMITTER
VCE = 6V
f = 10.7MHz
Ta = 25°C
PHASE ANGLE OF FORWARD TRANSFER ADMITTANCE θfe (°)
FORWARD TRANSFER ADMITTANCE |Yfe| (mS)
EMITTER CURRENT IE (mA)


g_{oe}, C_{oe} – V_{CE}
COMMON EMITTER
I_E = −1mA
f=10.7MHz, Ta=25°C
Y
O
R
V
O
B
g_{oe}
C_{oe}
OUTPUT CAPACITANCE C_{oe} (pF)
OUTPUT CONDUCTANCE g_{oe} (μS)
COLLECTOR-EMITTER VOLTAGE V_{CE} (V)


g_{oe}, C_{oe} – I_E
COMMON EMITTER
V_{CE} = 6V
f=10.7MHz
Ta=25°C
V
O
R
g_{oe}
C_{oe}
Y
O
R
OUTPUT CAPACITANCE C_{oe} (pF)
OUTPUT CONDUCTANCE g_{oe} (μS)
EMITTER CURRENT I_E (mA)


P_C – Ta
COLLECTOR POWER DISSIPATION P_C (mW)
AMBIENT TEMPERATURE Ta (°C)