

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL PLANAR TYPE (PCT PROCESS)

2SC380TM

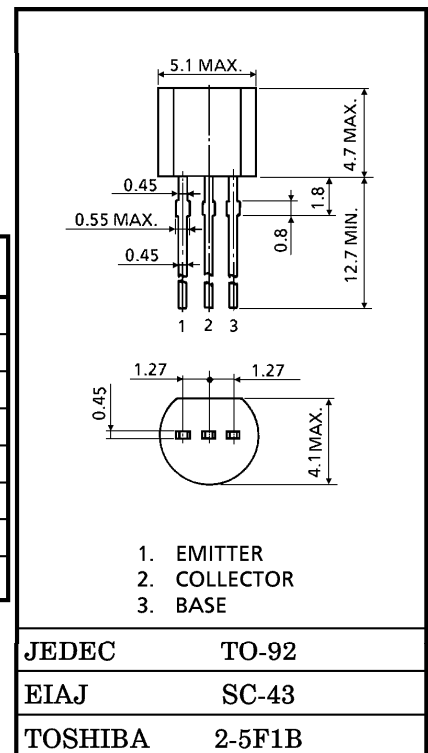
HIGH FREQUENCY AMPLIFIER APPLICATIONS

Unit in mm

- High Power Gain : $G_{pe} = 29\text{dB (Typ.)}$ ($f = 10.7\text{ MHz}$)
- 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_{CBO}	35	V
Collector-Emitter Voltage	V_{CEO}	30	V
Emitter-Base Voltage	V_{EBO}	4	V
Collector Current	I_C	50	mA
Emitter Current	I_E	-50	mA
Collector Power Dissipation	P_C	300	mW
Junction Temperature	T_j	125	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55~125	$^\circ\text{C}$

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

Weight : 0.21 g

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	I_{CBO}	$V_{CB} = 35\text{ V}, I_E = 0$	—	—	0.1	μA
Emitter Cut-off Current	I_{EBO}	$V_{EB} = 4\text{ V}, I_C = 0$	—	—	0.1	μA
DC Current Gain	h_{FE} (Note)	$V_{CE} = 12\text{ V}, I_C = 2\text{ mA}$	40	—	240	—
Collector-Emitter Saturation Voltage	$V_{CE}(\text{sat})$	$I_C = 10\text{ mA}, I_B = 1\text{ mA}$	—	—	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	—	400	MHz
Collector Output Capacitance	C_{ob}	$V_{CB} = 10\text{ V}, I_E = 0,$ $f = 1\text{ MHz}$	1.4	2.0	3.2	pF
Collector-Base Time Constant	$C_{c-rbb'}$	$V_{CE} = 10\text{ V}, I_E = -1\text{ mA},$ $f = 30\text{ MHz}$	10	—	50	ps
Power Gain	G_{pe}	$V_{CC} = 6\text{ V}, I_E = -1\text{ mA},$ $f = 10.7\text{ MHz (Fig.)}$	27	29	33	dB

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

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y PARAMETERS (Typ.)

(1) (COMMON EMITTER $f = 455 \text{ kHz}$, $T_a = 25^\circ\text{C}$)

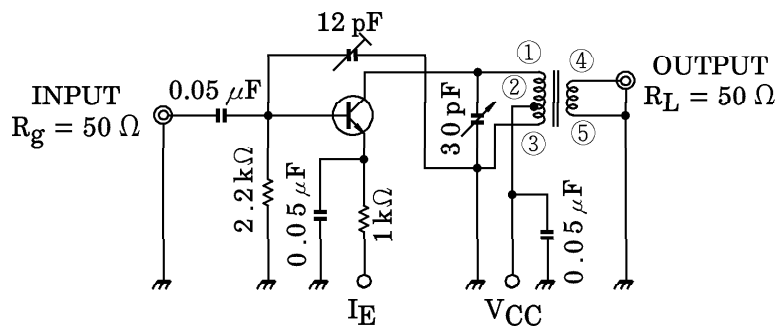
CHARACTERISTIC	SYMBOL	2SC380TM-R	2SC380TM-O	2SC380TM-Y	UNIT
Collector-Emitter Voltage	V_{CE}	6	6	6	V
Emitter Current	I_E	-1	-1	-1	mA
Input Conductance	g_{ie}	0.58	0.41	0.26	mS
Input Capacitance	C_{ie}	53	46	38	pF
Output Conductance	g_{oe}	1.9	2.7	4.8	μS
Output Capacitance	C_{oe}	2.6	2.8	3.6	pF
Forward 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 $f = 10.7 \text{ MHz}$, $T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	2SC380TM-R	2SC380TM-O	2SC380TM-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	°

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T : ①-② 0.1 mm ϕ UEW 20T
②-③ 0.1 mm ϕ UEW 8T
④-⑤ 0.1 mm ϕ UEW 2T

Fig.1 G_{pe} TEST CIRCUIT

