9097250 TOSHIBA (DISCRETE/OPTO)   56C 07852   DT-33-09

SILICON NPN TRIPLE DIFFUSED TYPE (PCT PROCESS)

2SD1052A

Unit in mm

AUDIO FREQUENCY POWER AMPLIFIER APPLICATIONS.
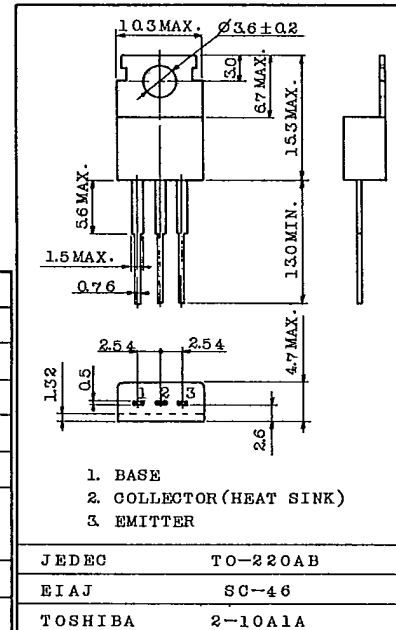
FEATURES :

. High DC Current Gain of 400 to 1200 at
         $V_{CE}=5V$, $I_C=0.5A$

. Low $V_{CE(sat)}$ of 1.0V (MAX.) at $I_C=1A$, $I_B=0.02A$

. Collector Power Dissipation of 30W at Tc=25°C

MAXIMUM RATINGS   (Ta=25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Base Voltage		V_{CBO}	50	V
Collector-Emitter Voltage		V_{CEO}	50	V
Emitter-Base Voltage		V_{EBO}	7	V
Collector Current		I_C	3	A
Base Current		I_B	0.5	A
Collector Power Dissipation	Ta=25°C	P_C	1.5	W
	Tc=25°C		30	
Junction Temperature		T_j	150	°C
Storage Temperature Range		T_{stg}	-55~150	°C

1. BASE
2. COLLECTOR(HEAT SINK)
3. EMITTER

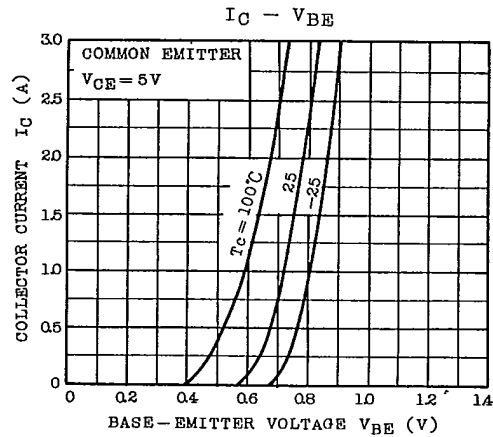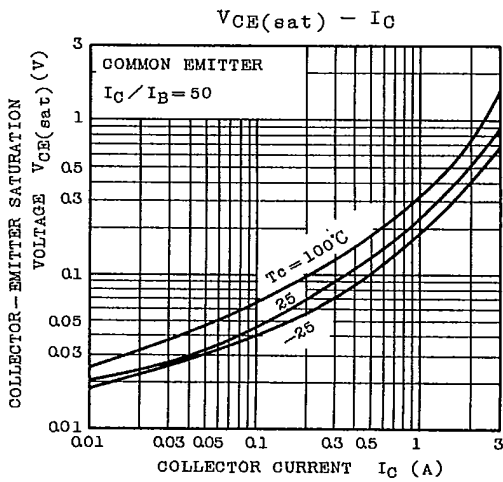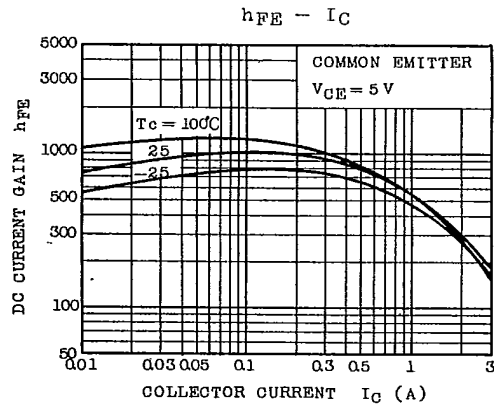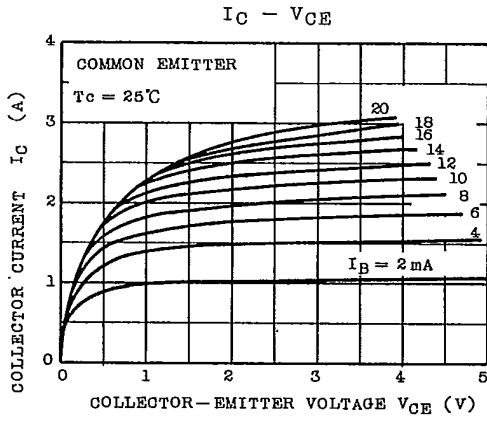| JEDEC	TO-220AB
EIAJ	SC-46
TOSHIBA	2-10A1A

Mounting kit No.AC75
Weight : 1.9g

ELECTRICAL CHARACTERISTICS   (Ta=25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current		I_{CBO}	$V_{CB}=50V$, $I_E=0$	—	—	100	μA
Emitter Cut-off Current		I_{EBO}	$V_{EB}=7V$, $I_C=0$	—	—	100	μA
Collector-Emitter Breakdown Voltage		$V_{(BR)CEO}$	$I_C=50mA$, $I_B=0$	50	—	—	V
DC Current Gain		h_{FE}	$V_{CE}=5V$, $I_C=0.5A$	400	—	1200	
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	$I_C=1A$, $I_B=0.02A$	—	0.25	1.0	V
Base-Emitter Voltage		V_{BE}	$V_{CE}=5V$, $I_C=0.5A$	—	0.7	1.0	V
Transition Frequency		f_T	$V_{CE}=5V$, $I_C=0.5A$	—	5.0	—	MHz
Collector Output Capacitance		C_{ob}	$V_{CB}=10V$, $I_E=0$, f=1MHz	—	70	—	pF
Switching Time	Turn-on Time	T_{on}		—	2.0	—	μs
	Storage Time	T_{stg}	$I_{B1}=10mA$, $I_{B2}=-20mA$, DUTY CYCLL <1%	—	5.0	—	
	Fall Time	T_f		—	3.0	—	

TOSHIBA CORPORATION

—785—

2SD1052A

$I_C - V_{CE}$

COMMON EMITTER
Tc = 25°C

COLLECTOR CURRENT I_C (A)

20
18
16
14
12
10
8
6
4

$I_B = 2\,mA$

COLLECTOR—EMITTER VOLTAGE V_{CE} (V)

$h_{FE} - I_C$

COMMON EMITTER
$V_{CE} = 5\,V$

DC CURRENT GAIN h_{FE}

Tc = 100°C
25
-25

COLLECTOR CURRENT I_C (A)

$V_{CE(sat)} - I_C$

COMMON EMITTER
$I_C / I_B = 50$

COLLECTOR—EMITTER SATURATION VOLTAGE $V_{CE(sat)}$ (V)

Tc = 100°C
25
-25

COLLECTOR CURRENT I_C (A)

$I_C - V_{BE}$

COMMON EMITTER
$V_{CE} = 5\,V$

COLLECTOR CURRENT I_C (A)

Tc = 100°C
25
-25

BASE—EMITTER VOLTAGE V_{BE} (V)

TOSHIBA CORPORATION

2SD1052A

$r_{th}(t) - t$

TRANSIENT THERMAL RESISTANCE $r_{th}(t)$ (℃/W)

(1) WITHOUT HEAT SINK
(2) INFINITE HEAT SINK

(1) Ta = 25℃
(2) Tc = 25℃

TIME t (sec)

$P_C - Ta$

COLLECTOR POWER DISSIPATION P_C (W)

① Tc = Ta
   INFINITE HEAT SINK
② 300 × 300 × 2mm Aℓ
   HEAT SINK
③ 200 × 200 × 2mm Aℓ
   HEAT SINK
④ 100 × 100 × 1mm Aℓ
   HEAT SINK
⑤ 100 × 100 × 1mm Fe
   HEAT SINK
⑥ 50 × 50 × 1mm Aℓ
   HEAT SINK
⑦ 50 × 50 × 1mm Fe
   HEAT SINK
⑧ NO HEAT
   SINK

AMBIENT TEMPERATURE Ta (℃)

SAFE OPERATING AREA

COLLECTOR CURRENT I_C (A)

I_C MAX. (PULSED)※

I_C MAX. (CONTINUOUS)

100ms ※   10ms ※   1ms
DC OPERATION Tc = 25℃   1s ※

V_{CEO} (MAX.)

※ SINGLE NONREPETITIVE
   PULSE Tc = 25℃
CURVES MUST BE DERATED
LINEARLY WITH INCREASE IN
TEMPERATURE

COLLECTOR—EMITTER VOLTAGE V_{CE} (V)

TOSHIBA CORPORATION

— 787 —