



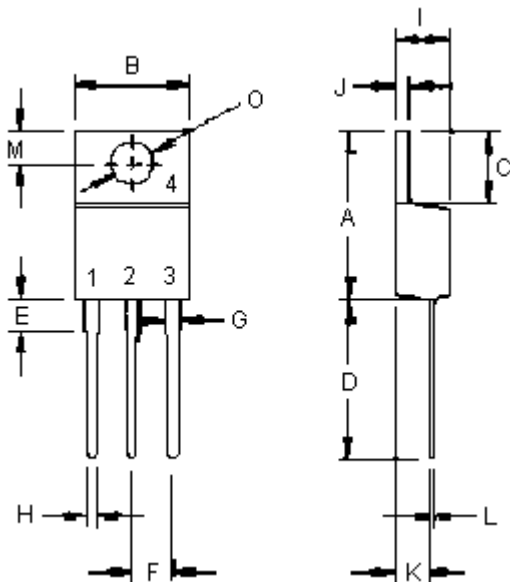
TO - 220

### Features:

- Complementary Silicon Plastic
- Collector - emitter sustaining voltage -  $V_{CEO(sus)} = 100\text{ V}$  (minimum) - TIP41C
- Collector - emitter saturation voltage -  $V_{CE(sat)} = 1.5\text{ V}$  (maximum) at  $I_C = 6\text{ A}$
- Current gain - bandwidth product  $f_T = 3\text{ MHz}$  (minimum) at  $I_C = 500\text{ mA}$

### Application:

Designed for use in general purpose power amplifier and switching applications



Dimensions	Millimetres	
	Minimum	Maximum
A	14.68	15.31
B	9.78	10.42
C	5.01	6.52
D	13.06	14.62
E	3.57	4.07
F	2.42	3.66
G	1.12	1.36
H	0.72	0.96
I	4.22	4.98
J	1.14	1.38
K	2.2	2.97
L	0.33	0.55
M	2.48	2.98
O	3.7	3.9

### Pin

1. Base
2. Collector
3. Emitter
4. Collector (Case)

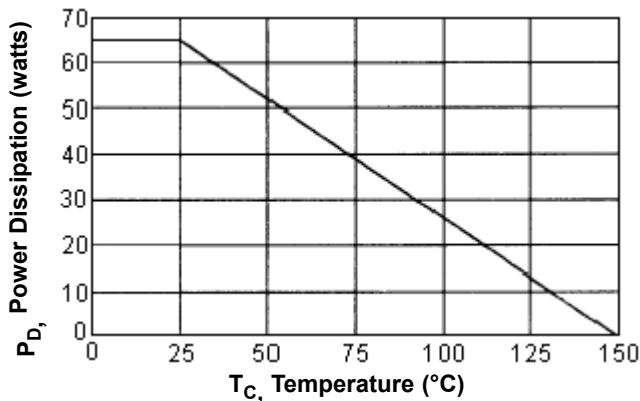
### Maximum Ratings

Characteristics	Symbol	TIP41C	Unit
Collector - emitter voltage	$V_{CEO}$	100	V
Collector - base voltage	$V_{CBO}$	100	V
Emitter - base voltage	$V_{EBO}$	5	V
Collector current - Continuous - Peak	$I_C$	6 10	A
Base current	$I_B$	2	A
Total power dissipation at $T_c = 25^\circ\text{C}$ derate above $25^\circ\text{C}$	$P_D$	65 0.52	W W/ $^\circ\text{C}$
Operating and storage Junction temperature range	$T_J, T_{STG}$	-65 to +150	$^\circ\text{C}$

## Thermal Characteristics

Characteristic	Symbol	Maximum	Unit
Thermal resistance junction to case	$R_{\theta jc}$	1.92	$^{\circ}\text{C/W}$

Power Derating



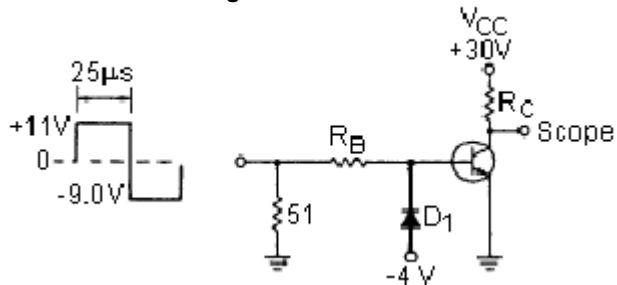
## Electrical Characteristics ( $T_c = 25^{\circ}\text{C}$ Unless Otherwise noted)

Characteristics	Symbol	Minimum	Maximum	Units
<b>Off Characteristics</b>				
Collector - emitter sustaining voltage (1) ( $I_C = 30 \text{ mA}$ , $I_B = 0$ )	$V_{CEO (SUS)}$	100	-	V
Collector cut off current ( $V_{CE} = 60 \text{ V}$ , $I_B = 0$ )	$I_{CEO}$	-	0.7	mA
Collector cut off current ( $V_{CE} = 100 \text{ V}$ , $V_{BE} = 0$ )	$I_{CES}$	-	0.4	mA
Emitter cut off current ( $V_{EB} = 5 \text{ V}$ , $I_C = 0$ )	$I_{EBO}$	-	1	mA
<b>On Characteristics (1)</b>				
DC current gain ( $I_C = 0.3 \text{ A}$ ; $V_{CE} = 4 \text{ V}$ ) ( $I_C = 3 \text{ A}$ ; $V_{CE} = 4 \text{ V}$ )	$h_{FE}$	30 15	75	-
Collector - emitter saturation voltage ( $I_C = 6 \text{ A}$ ; $I_B = 600 \text{ mA}$ )	$V_{CE (sat)}$	-	1.5	V
Base-emitter on voltage ( $I_C = 6 \text{ A}$ ; $V_{CE} = 4 \text{ V}$ )	$V_{BE (on)}$	-	2	V
<b>Dynamic characteristics</b>				
Current gain-bandwidth Product (2) ( $I_C = 500 \text{ mA}$ ; $V_{CE} = 10 \text{ V}$ , $f_{TEST} = 1 \text{ MHz}$ )	$f_T$	3	-	MHz
Small signal current gain ( $I_C = 500 \text{ mA}$ ; $V_{CE} = 10 \text{ V}$ , $f = 1 \text{ kHz}$ )	$h_{fe}$	20	-	-

(1) Pulse test: Pulse width  $\leq 300 \mu\text{s}$ , duty cycle  $\leq 2\%$

(2)  $f_T = |h_{fe}| \cdot f_{TEST}$

Switching Time Test Circuit



$t_r, t_f \leq 10 \text{ ns}$

Duty cycle = 1 %

$R_B$  and  $R_C$  varied to obtain desired current levels

$D_1$  must be fast recovery type eg:

MBD5300 Used Above  $I_B$  to 100 mA

MSD6100 Used Below  $I_B$  to 100 mA

Figure-3 Turn-on Time

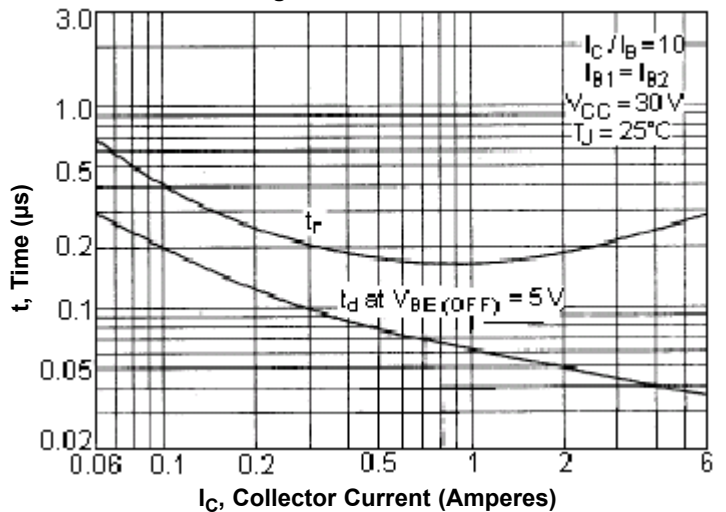


Figure-4 DC Current Gain

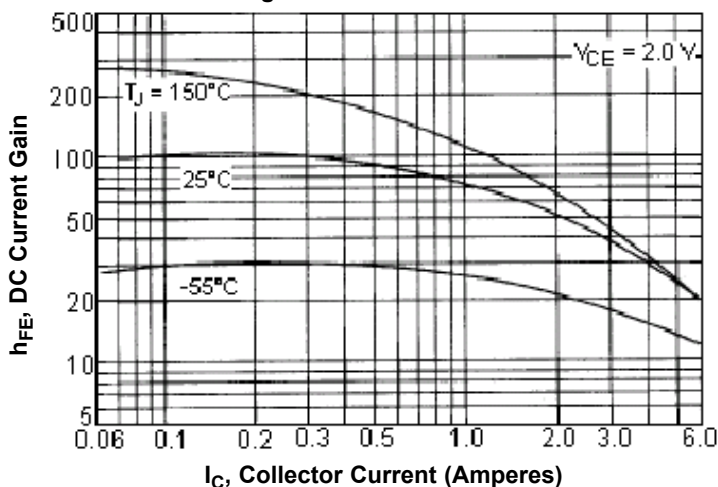


Figure-5 Turn-off Time

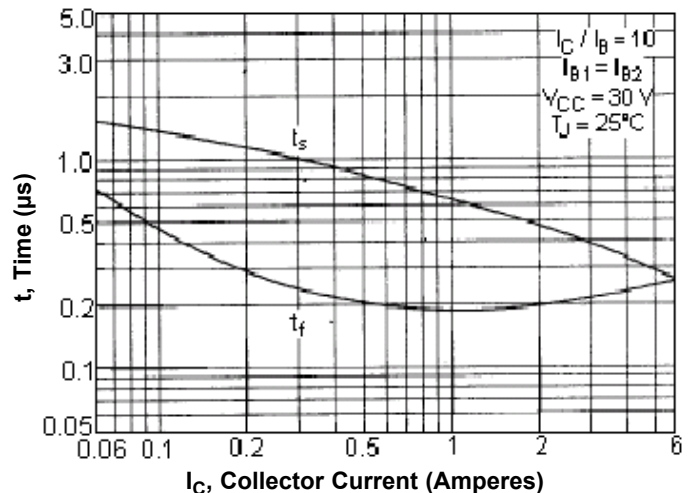
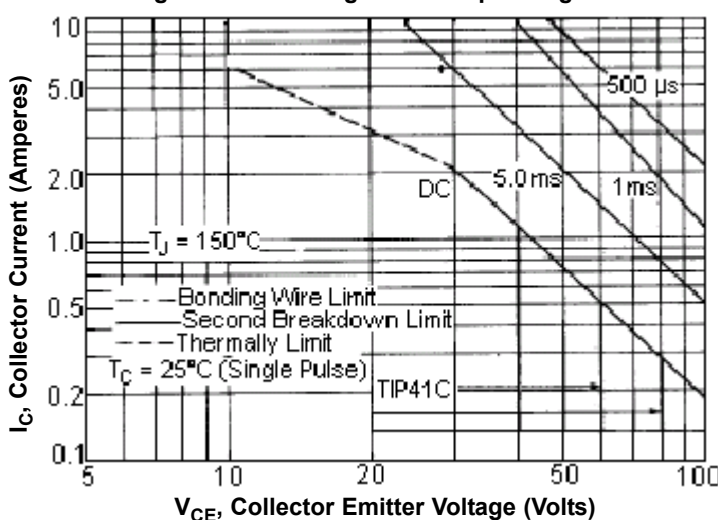


Figure-6 Active Region Safe Operating Area



There are two limitation on the power handling ability of a transistor: average junction temperature and second breakdown safe operating area curves indicate  $I_C$ - $V_{CE}$  limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater dissipation than curves indicate

The data of FIG-6 curve is base on  $T_{j(pk)} = 150^\circ\text{C}$ ;  $T_C$  is variable depending on power level, second breakdown pulse limits are valid for duty cycles to 10% provided  $T_{j(pk)} \leq 150^\circ\text{C}$ . At high case temperatures, thermal limitation will reduce the power that can be handled to values less than the limitations imposed by second breakdown

Figure-7 Collector Saturation Region

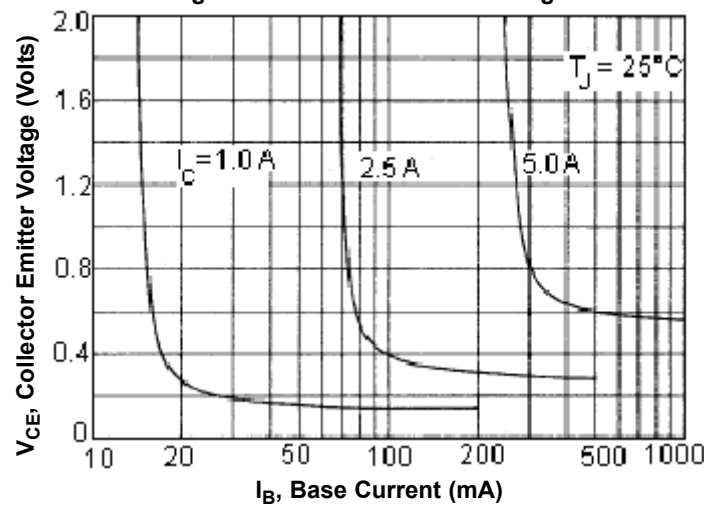


Figure-8 Capacitances

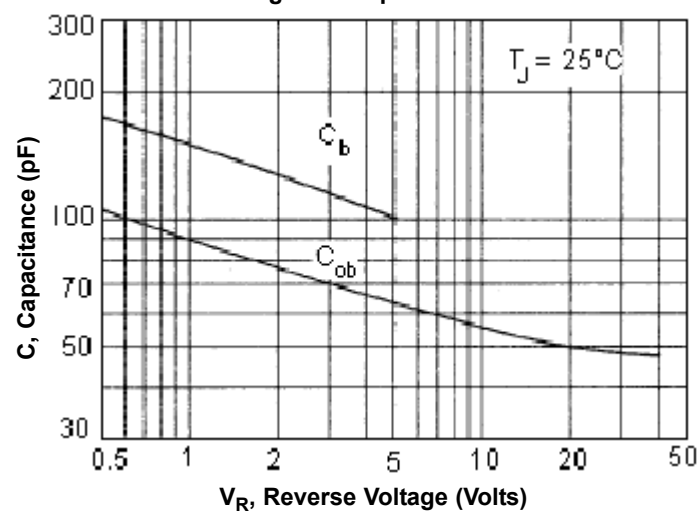


Figure-9 "ON" Voltage

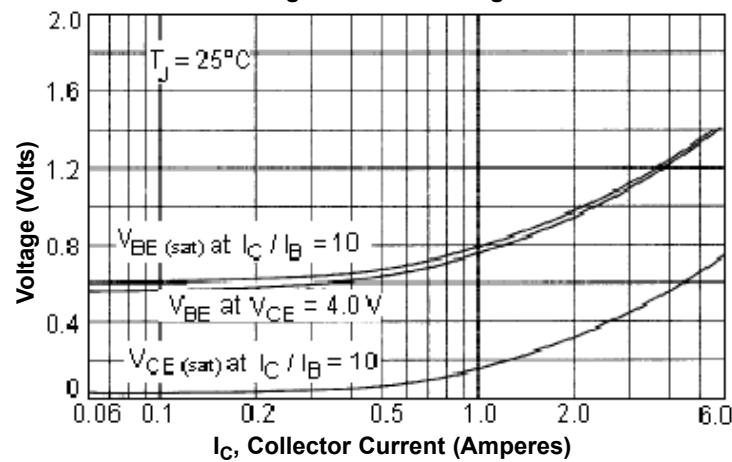
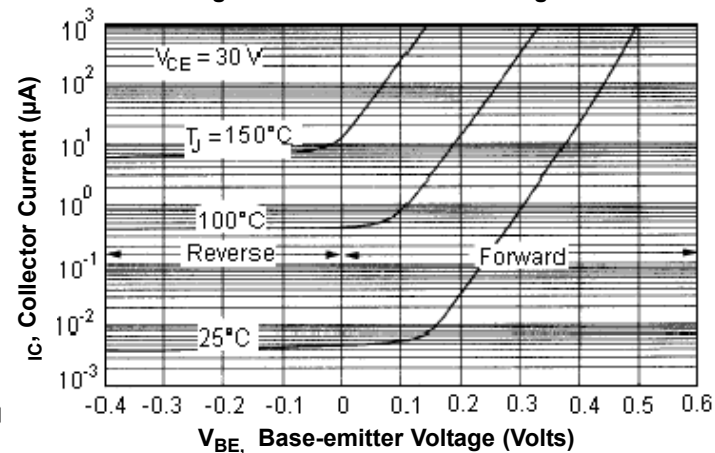


Figure-10 Collector Cut-off Region



## Part Number Table

Description	Part Number
Silicon Plastic Power Transistor, NPN	TIP41C

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