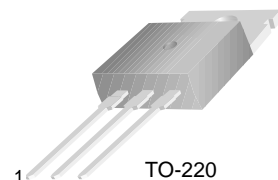


TIP47/48/49/50

High Voltage and Switching Applications

- High Sustaining Voltage : $V_{CEO(sus)} = 250 - 400V$
- 1A Rated Collector Current



TO-220
1.Base 2.Collector 3.Emitter

NPN Silicon Transistor

Absolute Maximum Ratings $T_C=25^\circ C$ unless otherwise noted

Symbol	Parameter	Value	Units
V_{CBO}	Collector-Base Voltage : TIP47	350	V
	: TIP48	400	V
	: TIP49	450	V
	: TIP50	500	V
V_{CEO}	Collector-Emitter Voltage : TIP47	250	V
	: TIP48	300	V
	: TIP49	350	V
	: TIP50	400	V
V_{EBO}	Emitter-Base Voltage	5	V
I_C	Collector Current (DC)	1	A
I_{CP}	Collector Current (Pulse)	2	A
I_B	Base Current	0.6	A
P_C	Collector Dissipation ($T_C=25^\circ C$)	40	W
P_C	Collector Dissipation ($T_a=25^\circ C$)	2	W
T_J	Junction Temperature	150	$^\circ C$
T_{STG}	Storage Temperature	- 65 ~ 150	$^\circ C$

Electrical Characteristics $T_C=25^\circ C$ unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Max.	Units
$V_{CEX(sus)}$	Collector-Emitter Sustaining Voltage	$I_C = 30mA, I_B = 0$	250		V
	: TIP47				
	: TIP48				
	: TIP49				
I_{CEO}	Collector Cut-off Current : TIP47	$V_{CE} = 150V, I_B = 0$		1	mA
	: TIP48	$V_{CE} = 200V, I_B = 0$		1	mA
	: TIP49	$V_{CE} = 250V, I_B = 0$		1	mA
	: TIP50	$V_{CE} = 300V, I_B = 0$		1	mA
I_{CEX}	Collector Cut-off Current : TIP47	$V_{CE} = 350V, V_{BE} = 0$		1	mA
	: TIP48	$V_{CE} = 400V, V_{BE} = 0$		1	mA
	: TIP49	$V_{CE} = 450V, V_{BE} = 0$		1	mA
	: TIP50	$V_{CE} = 500V, V_{BE} = 0$		1	mA
I_{EBO}	Emitter Cut-off Current	$V_{EB} = 5V, I_C = 0$		1	mA
h_{FE}	* DC Current Gain	$V_{CE} = 10V, I_C = 0.3A$ $V_{CE} = 10V, I_C = 1A$	30 10	150	
$V_{CE(sat)}$	* Collector-Emitter Saturation Voltage	$I_C = 1A, I_B = 0.2A$		1	V
$V_{BE(sat)}$	* Base-Emitter Saturation Voltage	$V_{CE} = 10V, I_C = 1A$		1.5	V
f_T	Current Gain Bandwidth Product	$V_{CE} = 10V, I_C = 0.2A$	10		MHz
t_{ON}	Turn ON Time	$V_{CC} = 400V$ $5I_{B1} = -2.5I_{B2} = I_C = 6A$ $R_L = 66.7\Omega$		0.5	μs
t_{STG}	Storage Time			3	μs
t_F	Fall Time			0.3	μs

* Pulse Test: $PW \leq 300\mu s$, duty Cycle $\leq 2\%$ Pulse

Typical Characteristics

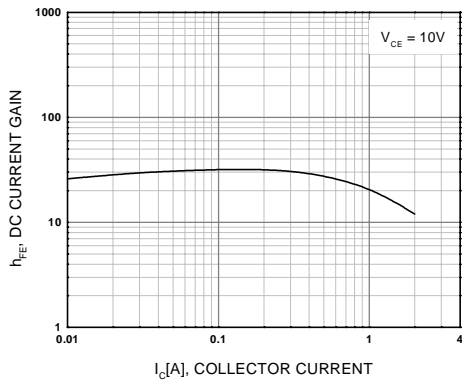


Figure 1. DC current Gain

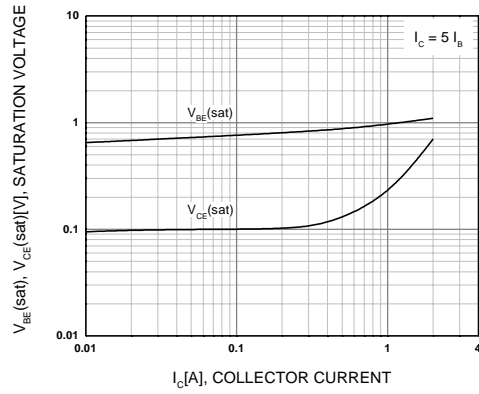


Figure 2. Collector-Emitter Saturation Voltage
Base-Emitter Saturation Voltage

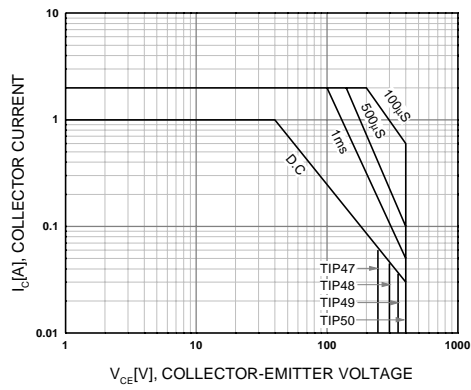


Figure 3. Safe Operating Area

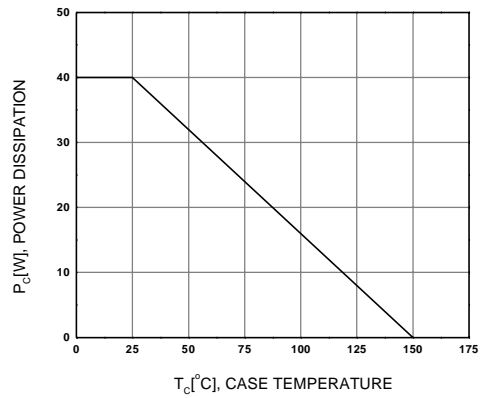


Figure 4. Power Derating

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