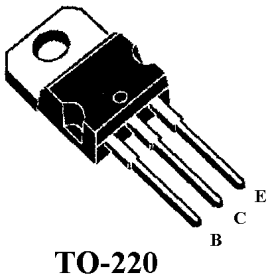
NPN SILICON POWER TRANSISTOR TIP31C

- **40 W at 25ºC Case Temperature**
- **3A Continuous Collector Current**
- **5A Peak Collector Current**
- **100V Collector-Emitter Voltage**
- **Isolated transistor package available on request**
- **Custom selections possible**



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Note : Collector is connected to the mounting base

Absolute maximum ratings at 25ºC case temperature (unless otherwise noted)

RATING	SYMBOL	VALUE	UNIT
Collector-Base Voltage (Ie=0)	V_{CBO}	140	V
Collector-Emitter Voltage (Ib=0)	V_{CEO}	100	V
Emitter-base voltage (reverse)	V_{EBO}	5	V
Continuous collector current	I_C	3	A
Peak collector current (max 300µs, duty cycle 2%)	I_{CM}	5	A
Continuous base current	I_B	1	A
Continuous device dissipation at max 25ºC case temperature (see note 1)	P_{tot}	40	W
Continuous device dissipation at max 25ºC free air temperature (see note 2)	P_{tot}	2	W
Unclamped inductive load energy (see note 3)	$½LI_C^2$	32	mJ
Operating junction temperature range	T_j	-65 to +150	ºC
Storage temperature range	T_{stg}	-65 to +150	ºC
Lead temperature 3.2 mm from case for 10 seconds	T_L	250	ºC

NOTES

1. Derate linearly to 150ºC case temperature at the rate of 0.32 W/ºC. This rating is not applicable to isolated packages.
2. Derate linearly to 150ºC free air temperature at the rate of 16 mW/ºC
3. This rating is based on the capability of the transistor to operate safely in a circuit of: L=20 mH, $I_{B(on)}$=30mA, R_{BE} = 270 ohm, $V_{BE(off)}$ = 0, R_S = 0.1 ohm, I_{CC} = 1.8A., duty max 1%.

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Electrical characteristics at 25°C case temperature

PARAMETER		TEST CONDITIONS			MIN	TYP	MAX	UNIT
$V_{(BR)CEO}$	Collector-emitter breakdown voltage	I_C = 30 mA	I_B = 0	(see note 4)	100	120		V
I_{CES}	Collecor-emitter cut-off current	V_{CE} = 140V	V_{BE} = 0			0.02	200	µA
I_{CEO}	Collector cut-off current	V_{CE} = 100V	I_B = 0			0.02	300	µA
I_{EBO}	Emitter cut-off current	V_{EB} = 5V	I_C = 0				1	mA
h_{FE}	Forward current transfer ratio	V_{CE} = 4V V_{CE} = 4V	I_C = 150mA I_C = 1.5A	 (see notes 4 and 5)	30 15	100 60		
$V_{CE(sat)}$	Collector-emitter saturation voltage	I_B = 300mA	I_C = 3A	(see notes 4 and 5)			1.2	V
V_{be}	Base-emitter voltage	Vce = 4V	I_C = 3A	(see notes 4 and 5)			1.8	V
h_{fe}	Small signal forward current transfer ra	V_{CE} = 10V	I_C = 500mA	f = 1 kHz	20			

NOTES

4. Measured in pulse mode tp=300µs, duty cycle <2%
5. To be measured using sense contacts for base and emitter.

Thermal characteristics

PARAMETER		MIN	TYP	MAX	UNIT
$R_{èJC}$	Junction to case thermal resistance			3.12	°C/W
$R_{èJA}$	Junction to free air thermal resistance			62.5	°C/W

Resistive-load-switching characteristics at 25°C case temperature

PARAMETER		TEST CONDITIONS			MIN	TYP	MAX	UNIT
t_{on}	Turn-on time	I_C = 1A	$I_{B(on)}$ = 100mA	$I_{B(off)}$ = -100mA		0.3		µs
t_{off}	Turn-off time	$V_{BE(off)}$ = -4 V	R_L = 20 ohm	t_P = 20 µs		1		µs