

TIP31 SERIES

(TIP31/31A/31B/31C) NPN EXITAXIAL SILICON TRANSISTOR

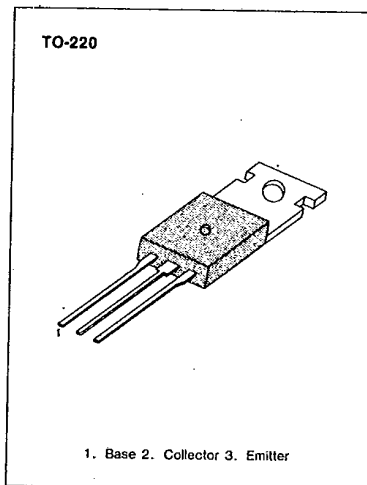
T-33-11

MEDIUM POWER LINEAR
SWITCHING APPLICATIONS

- Complement to TIP32/32A/32B/32C

ABSOLUTE MAXIMUM RATINGS ($T_a=25^\circ\text{C}$)

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	V_{CBO}	TIP31	40 V
		TIP31A	60 V
		TIP31B	80 V
		TIP31C	100 V
Collector-Emitter Voltage	V_{CEO}	TIP31	40 V
		TIP31A	60 V
		TIP31B	80 V
		TIP31C	100 V
Emitter-Base Voltage	V_{EBO}	5 V	V
Collector Current (DC)	I_C	3 A	A
Collector Current (Pulse)	I_C	5 A	A
Base Current	I_B	1 A	A
Collector Dissipation ($T_c=25^\circ\text{C}$)	P_C	40 W	W
Collector Dissipation ($T_a=25^\circ\text{C}$)	P_C	2 W	W
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-65~150	$^\circ\text{C}$



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

Characteristic	Symbol	Test Condition	Min	Max	Unit
* Collector Emitter Sustaining Voltage	BV_{CEO} (SUS)	$I_C=30\text{mA}, I_B=0$	TIP31	40	V
			TIP31A	60	V
			TIP31B	80	V
			TIP31C	100	V
Collector Cutoff Current	I_{CEO}	$V_{CE}=30\text{V}, I_B=0$	TIP31/31A	0.3	mA
			TIP31B/31C	0.3	mA
Collector Cutoff Current	I_{CES} *	$V_{CE}=40\text{V}, V_{EB}=0$	TIP31	200	μA
			TIP31A	200	μA
			TIP31B	200	μA
			TIP31C	200	μA
Emitter Cutoff Current	I_{EBO}	$V_{BE}=5\text{V}, I_C=0$	1	mA	
* DC Current Gain	h_{FE}	$V_{CE}=4\text{V}, I_C=1\text{A}$	TIP31	25	
			TIP31A	10	50
* Collector-Emitter Saturation Voltage	$V_{CE}(\text{sat})$	$I_C=3\text{A}, I_B=375\text{mA}$	1.2	V	
* Base-Emitter On Voltage	$V_{BE}(\text{on})$	$V_{CE}=4\text{V}, I_C=3\text{A}$	1.8	V	
Current Gain Bandwidth Product	f_T	$V_{CE}=10\text{V}, I_C=500\text{mA}$ $f=1\text{MHz}$	3.0	MHz	

* Pulse Test: $PW \leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$

TIP31 SERIES

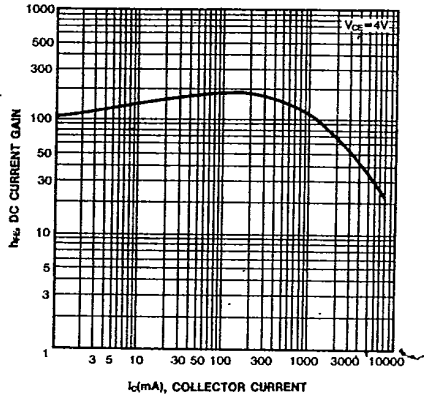
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(TIP31/31A/31B/31C) NPN EXITAXIAL SILICON TRANSISTOR

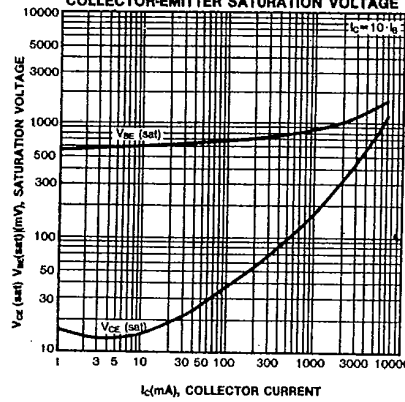
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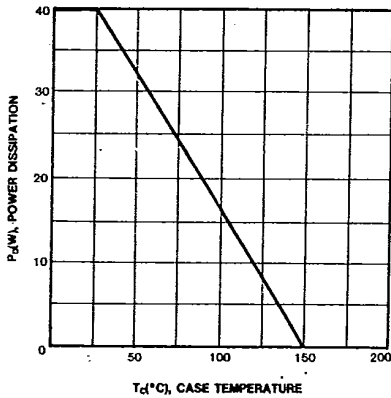
DC CURRENT GAIN



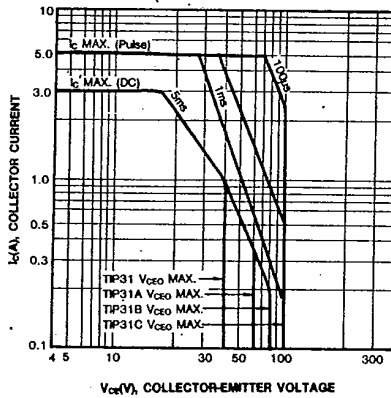
BASE-EMITTER SATURATION VOLTAGE
COLLECTOR-EMITTER SATURATION VOLTAGE



POWER DERATING



SAFE OPERATING AREA



TIP32 SERIES

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(TIP32/32A/32B/32C) PNP EXITAXIAL SILICON TRANSISTOR

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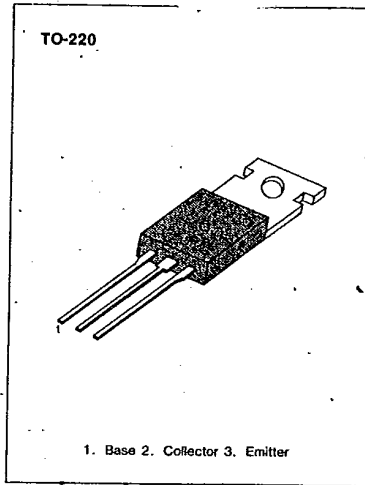
T-33-19

MEDIUM POWER LINEAR SWITCHING APPLICATIONS

• Complement to TIP31/31A/31B/31C

ABSOLUTE MAXIMUM RATINGS (T_a=25°C)

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage : TIP32	V _{CB0}	-40	V
: TIP32A		-60	V
: TIP32B		-80	V
: TIP32C		-100	V
Collector-Emitter Voltage : TIP32	V _{CE0}	-40	V
: TIP32A		-60	V
: TIP32B		-80	V
: TIP32C		-100	V
Emitter-Base Voltage	V _{EB0}	-5	V
Collector Current (DC)	I _C	-3	A
Collector Current (Pulse)	I _C	-5	A
Base Current	I _B	-1	A
Collector Dissipation (T _c =25°C)	P _C	40	W
Collector Dissipation (T _a =25°C)	P _C	2	W
Junction Temperature	T _J	150	°C
Storage Temperature	T _{stg}	-65~150	°C



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ELECTRICAL CHARACTERISTICS (T_c=25°C)

Characteristic	Symbol	Test Condition	Min	Max	Unit
*Collector Emitter Sustaining Voltage : TIP32	BV _{CEO} (sus)	I _C =-30mA, I _B =0	-40		V
: TIP32A			-60		V
: TIP32B			-80		V
: TIP32C			-100		V
Collector Cutoff Current : TIP32/32A	I _{CEO}	V _{CE} =-30V, I _B =0		-0.3	mA
: TIP32B/32C		V _{CE} =-60V, I _B =0		-0.3	mA
Collector Cutoff Current : TIP32	I _{CES}	V _{CE} =-40V, V _{EB} =0		-200	μA
: TIP32A		V _{CE} =-60V, V _{EB} =0		-200	μA
: TIP32B		V _{CE} =-80V, V _{EB} =0		-200	μA
: TIP32C		V _{CE} =-100V, V _{CE} =0		-200	μA
Emitter Cutoff Current	I _{EBO}	V _{BE} =-5V, I _C =0		-1	mA
*DC Current Gain	h _{FE}	V _{CE} =-4V, I _C =-1A	25		
		V _{CE} =-4V, I _C =-3A	10	50	
*Collector-Emitter Saturation Voltage	V _{CE} (sat)	I _C =-3A, I _B =-375mA		-1.2	V
*Base-Emitter On Voltage	V _{BE} (on)	V _{CE} =-4V, I _C =-3A		-1.8	V
Current Gain Bandwidth Product	f _T	V _{CE} =-10V, I _C =-500mA f=1MHz	3.0		MHz

* Pulse Test: PW≤300μs, Duty Cycle≤2%

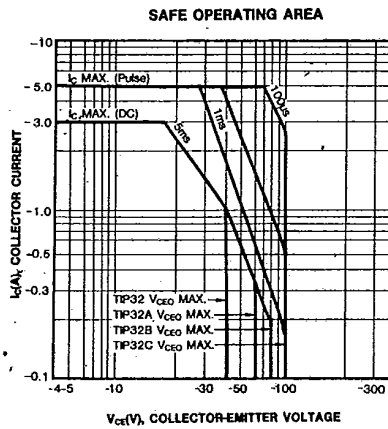
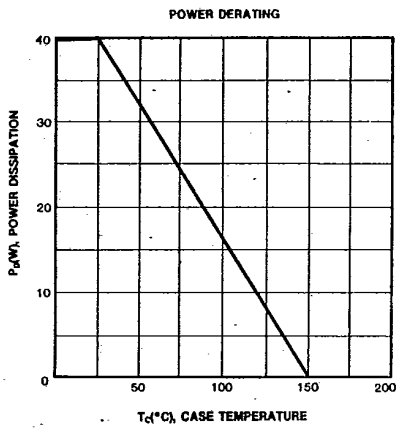
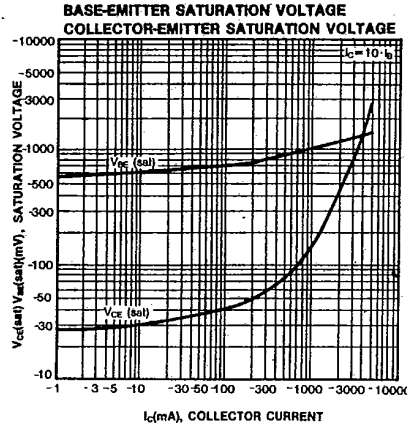
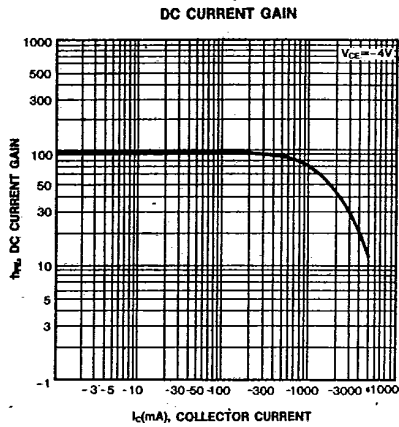
TIP32 SERIES

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(TIP32/32A/32B/32C) PNP EXITAXIAL SILICON TRANSISTOR

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TIP41 SERIES
(TIP41/41A/41B/41C) NPN EXITAXIAL SILICON TRANSISTOR

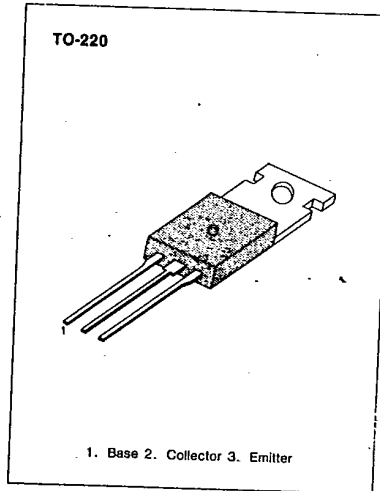
T-33-11

MEDIUM POWER LINEAR SWITCHING APPLICATIONS

• Complement to TIP42/42A/42 B/42C

ABSOLUTE MAXIMUM RATINGS (T_a=25°C)

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	V _{CB0}	TIP41	40 V
		TIP41A	60 V
		TIP41B	80 V
		TIP41C	100 V
Collector-Emitter Voltage	V _{CE0}	TIP41	40 V
		TIP41A	60 V
		TIP41B	80 V
		TIP41C	100 V
Emitter-Base Voltage	V _{EB0}	5 V	V
Collector Current (DC)	I _C	6 A	A
Collector Current (Pulse)	I _C	10 A	A
Base Current	I _B	2 A	A
Collector Dissipation (T _c =25°C)	P _C	65 W	W
Collector Dissipation (T _a =25°C)	P _C	2 W	W
Junction Temperature	T _J	150 °C	°C
Storage Temperature	T _{stg}	-65~150 °C	°C



3

ELECTRICAL CHARACTERISTICS (T_c=25°C)

Characteristic	Symbol	Test Condition	Min	Max	Unit
* Collector Emitter Sustaining Voltage	BV _{CEO} (sus)	I _C =30mA, I _B =0	TIP41	40	V
			TIP41A	60	V
			TIP41B	80	V
			TIP41C	100	V
Collector Cutoff Current	I _{CEO}	V _{CE} =30V, I _B =0	TIP41/41A	0.7	mA
			TIP41B/41C	0.7	mA
Collector Cutoff Current	I _{CES}	V _{CE} =40V, V _{EB} =0	TIP41	400	μA
			TIP41A	400	μA
			TIP41B	400	μA
			TIP41C	400	μA
Emitter Cutoff Current	I _{EBO}	V _{BE} =5V, I _C =0	1	mA	
* DC Current Gain	h _{FE}	V _{CE} =4V, I _C =0.3A	TIP41	30	
			TIP41A	15	75
* Collector-Emitter Saturation Voltage	V _{CE} (sat)	I _C =6A, I _B =600mA	1.5	V	
* Base-Emitter On Voltage	V _{BE} (on)	V _{CE} =4V, I _C =6A	2.0	V	
Current Gain Bandwidth Product	f _T	V _{CE} =10V, I _C =500mA f=1MHz	3.0	MHz	

* Pulse Test: PW≤300μs, Duty Cycle≤2%

TIP41 SERIES

(TIP41/41A/41B/41C) NPN EPITAXIAL SILICON TRANSISTOR

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