SAMSUNG SEMICONDUCTOR INC 14E D 7964142 0007716 1

TIP31 SERIES

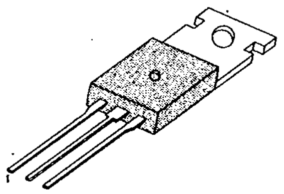
(TIP31/31A/31B/31C) NPN EXITAXIAL SILICON TRANSISTOR

T-33-11

MEDIUM POWER LINEAR SWITCHING APPLICATIONS

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

TO-220



1. Base 2. Collector 3. Emitter

ABSOLUTE MAXIMUM RATINGS (T_a=25°C)

Characteristic		Symbol	Rating	Unit
Collector-Base Voltage	: TIP31	V_{CBO}	40	V
	: TIP31A		60	V
	: TIP31B		80	V
	: TIP31C		100	V
Collector-Emitter Voltage	: TIP31	V_{CEO}	40	V
	: TIP31A		60	V
	: TIP31B		80	V
	: TIP31C		100	V
Emitter-Base Voltage		V_{EBO}	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		Tj	150	°C
Storage Temperature		Tstg	−65~150	°C

ELECTRICAL CHARACTERISTICS (T_c=25°C)

Characteristic		Symbol	Test Condition	Min	Max	Unit
*Collector Emitter Sustaining Voltage	: TIP31	BV_{CEO} (sus)	I_C=30mA, I_B=0	40		V
	: TIP31A			60		V
	: TIP31B			80		V
	: TIP31C			100		V
Collector Cutoff Current	: TIP31/31A	I_{CEO}	V_{CE}=30V, I_B=0		0.3	mA
	: TIP31B/31C		V_{CE}=60V, I_B=0		0.3	mA
Collector Cutoff Current	: TIP31	I_{CES}	V_{CE}=40V, V_{EB}=0		200	μA
	: TIP31A		V_{CE}=60V, V_{EB}=0		200	μA
	: TIP31B		V_{CE}=80V, V_{EB}=0		200	μA
	: TIP31C		V_{CE}=100V, V_{EB}=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%

TIP31 SERIRES

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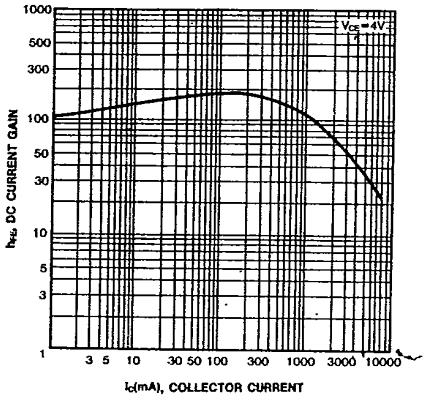
(TIP31/31A/31B/31C) NPN EXITAXIAL SILICON TRANSISTOR

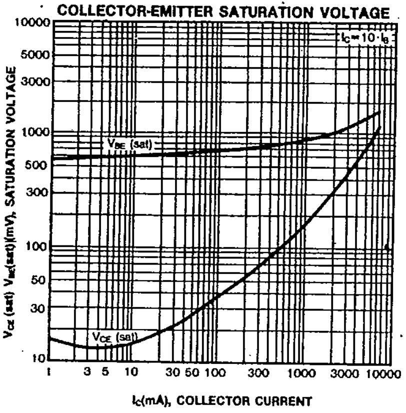
SAMSUNG SEMICONDUCTOR INC

T-33-11

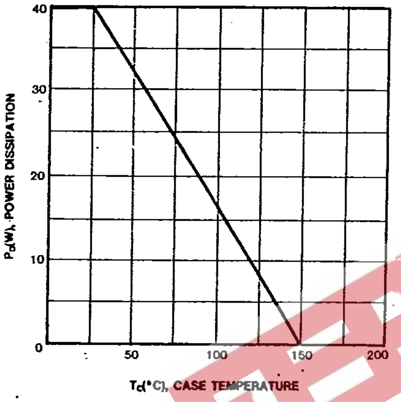
DC CURRENT GAIN



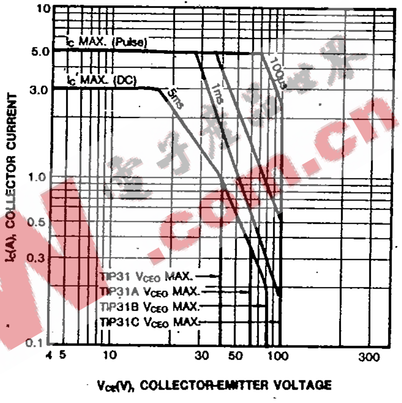
BASE-EMITTER SATURATION VOLTAGE
COLLECTOR-EMITTER SATURATION VOLTAGE



POWER DERATING



SAFE OPERATING AREA



TIP32 SERIRES

14E D 7964142 0007718 5

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

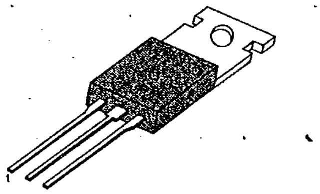
SAMSUNG SEMICONDUCTOR INC

T-33-19

MEDIUM POWER LINEAR SWITCHING APPLICATIONS

- Complement to TIP31/31A/31B/31C

TO-220



1. Base 2. Collector 3. Emitter

ABSOLUTE MAXIMUM RATINGS (T_a=25°C)

Characteristic		Symbol	Rating	Unit
Collector-Base Voltage	: TIP32	V_{CBO}	−40	V
	: TIP32A		−60	V
	: TIP32B		−80	V
	: TIP32C		−100	V
Collector-Emitter Voltage	: TIP32	V_{CEO}	−40	V
	: TIP32A		−60	V
	: TIP32B		−80	V
	: TIP32C		−100	V
Emitter-Base Voltage		V_{EBO}	−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

ELECTRICAL CHARACTERISTICS (T_c=25°C)

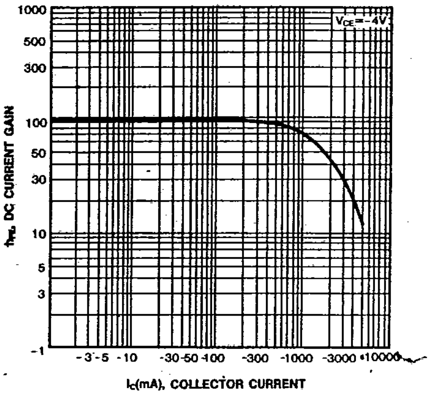
Characteristic		Symbol	Test Condition	Min	Max	Unit
*Collector Emitter Sustaining Voltage	: TIP32	BV_{CEO} (sus)	I_C=−30mA, I_B=0	−40		V
	: TIP32A			−60		V
	: TIP32B			−80		V
	: TIP32C			−100		V
Collector Cutoff Current	: TIP32/32A	I_{CEO}	V_{CE}=−30V, I_B=0		−0.3	mA
	: TIP32B/32C		V_{CE}=−60V, I_B=0		−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%

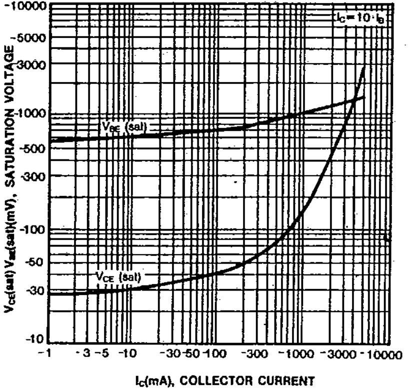
TIP32 SERIRES
(TIP32/32A/32B/32C) PNP EXITAXIAL SILICON TRANSISTOR

T-33-19

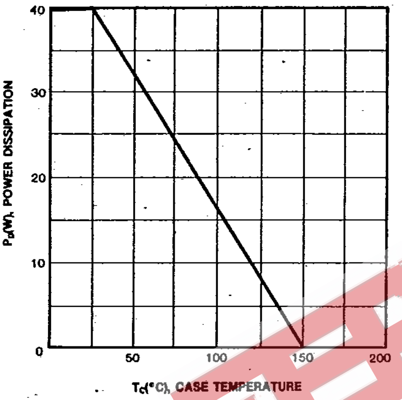
DC CURRENT GAIN



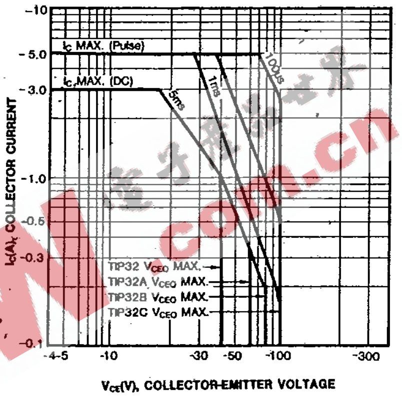
BASE-EMITTER SATURATION VOLTAGE
COLLECTOR-EMITTER SATURATION VOLTAGE



POWER DERATING



SAFE OPERATING AREA



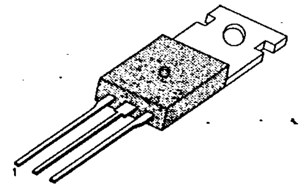
TIP41 SERIES
(TIP41/41A/41B/41C) NPN EXITAXIAL SILICON TRANSISTOR

T-33-11

MEDIUM POWER LINEAR SWITCHING APPLICATIONS

- Complement to TIP42/42A/42 B/42C

TO-220



1. Base 2. Collector 3. Emitter

ABSOLUTE MAXIMUM RATINGS (T_a=25°C)

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage : TIP41	V_{CBO}	40	V
: TIP41A		60	V
: TIP41B		80	V
: TIP41C		100	V
Collector-Emitter Voltage : TIP41	V_{CEO}	40	V
: TIP41A		60	V
: TIP41B		80	V
: TIP41C		100	V
Emitter-Base Voltage	V_{EBO}	5	V
Collector Current (DC)	I_C	6	A
Collector Current (Pulse)	I_C	10	A
Base Current	I_B	2	A
Collector Dissipation (T_c=25°C)	P_C	65	W
Collector Dissipation (T_a=25°C)	P_C	2	W
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	−65~150	°C

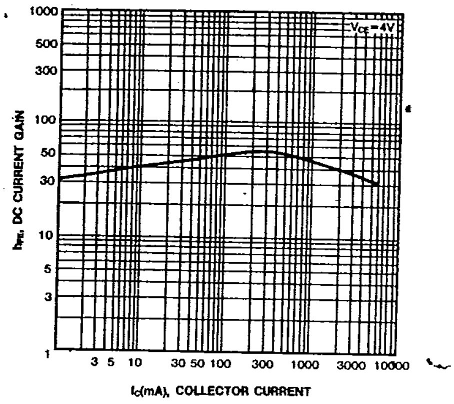
ELECTRICAL CHARACTERISTICS (T_c=25°C)

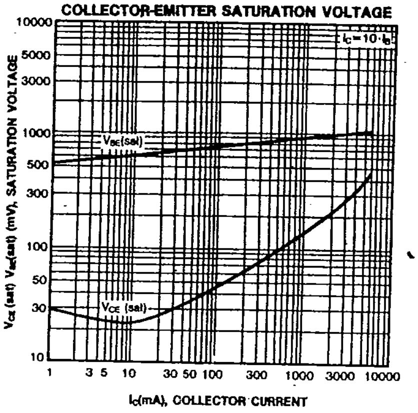
Characteristic	Symbol	Test Condition	Min	Max	Unit
*Collector Emitter Sustaining Voltage : TIP41	BV_{CEO} (sus)	I_C=30mA, I_B=0	40		V
: TIP41A			60		V
: TIP41B			80		V
: TIP41C			100		V
Collector Cutoff Current : TIP41/41A	I_{CEO}	V_{CE}=30V, I_B=0		0.7	mA
: TIP41B/41C		V_{CE}=60V, I_B=0		0.7	mA
Collector Cutoff Current : TIP41	I_{CES}	V_{CE}=40V, V_{EB}=0		400	μA
: TIP41A		V_{CE}=60V, V_{EB}=0		400	μA
: TIP41B		V_{CE}=80V, V_{EB}=0		400	μA
: TIP41C		V_{CE}=100V, V_{EB}=0		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	30		
		V_{CE}=4V, I_C=3A	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

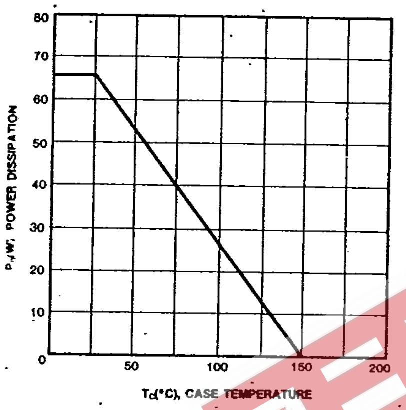
* Pulse Test: PW≤300μs, Duty Cycle≤2%

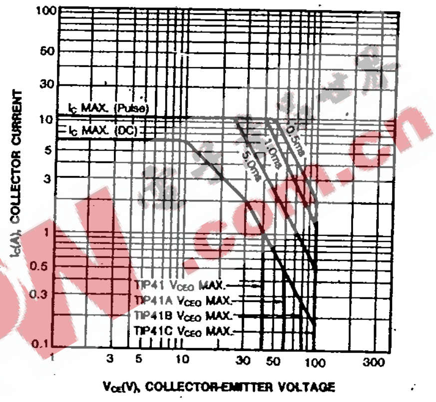
TIP41 SERIRES
(TIP41/41A/41B/41C) NPN EXITAXIAL SILICON TRANSISTOR

T-33-11


DC CURRENT GAIN


BASE-EMITTER SATURATION VOLTAGE
COLLECTOR-EMITTER SATURATION VOLTAGE


POWER DERATING


SAFE OPERATING AREA