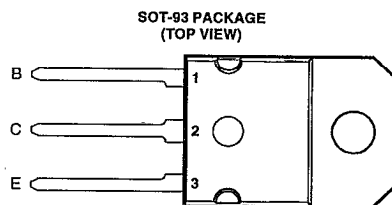


TIP33, TIP33A, TIP33B, TIP33C NPN SILICON POWER TRANSISTORS

JULY 1968 - REVISED MAY 1995

- Designed for Complementary Use with the TIP34 Series
- 80 W at 25°C Case Temperature
- 10 A Continuous Collector Current
- 15 A Peak Collector Current
- Customer-Specified Selections Available



Pin 2 is in electrical contact with the mounting base.

MDTRA4

absolute maximum ratings at 25°C case temperature (unless otherwise noted)

RATING		SYMBOL	VALUE	UNIT
Collector-base voltage ($I_E = 0$)	TIP33	V_{CBO}	80	V
	TIP33A		100	
	TIP33B		120	
	TIP33C		140	
Collector-emitter voltage ($I_B = 0$)	TIP33	V_{CEO}	40	V
	TIP33A		60	
	TIP33B		80	
	TIP33C		100	
Emitter-base voltage		V_{EBO}	5	V
Continuous collector current		I_C	10	A
Peak collector current (see Note 1)		I_{CM}	15	A
Continuous base current		I_B	3	A
Continuous device dissipation at (or below) 25°C case temperature (see Note 2)		P_{tot}	80	W
Continuous device dissipation at (or below) 25°C free air temperature (see Note 3)		P_{tot}	3.5	W
Unclamped inductive load energy (see Note 4)		$\frac{1}{2}LI_C^2$	62.5	mJ
Operating junction temperature range		T_J	-65 to +150	°C
Storage temperature range		T_{stg}	-65 to +150	°C
Lead temperature 3.2 mm from case for 10 seconds		T_L	250	°C

NOTES: 1. This value applies for $t_p \leq 0.3$ ms, duty cycle $\leq 10\%$.

2. Derate linearly to 150°C case temperature at the rate of 0.64 W/°C.

3. Derate linearly to 150°C free air temperature at the rate of 28 mW/°C.

4. This rating is based on the capability of the transistor to operate safely in a circuit of: $L = 20$ mH, $I_{B(on)} = 0.4$ A, $R_{BE} = 100 \Omega$, $V_{BE(off)} = 0$, $R_B = 0.1 \Omega$, $V_{CC} = 20$ V.

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TIP33, TIP33A, TIP33B, TIP33C NPN SILICON POWER TRANSISTORS

JULY 1968 - REVISED MAY 1995

electrical characteristics at 25°C case temperature

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
$V_{(BR)CEO}$ Collector-emitter breakdown voltage	$I_C = 30 \text{ mA}$ (see Note 5) $I_B = 0$	TIP33 40 TIP33A 60 TIP33B 80 TIP33C 100			V
I_{CES} Collector-emitter cut-off current	$V_{CE} = 80 \text{ V}$ $V_{BE} = 0$ $V_{CE} = 100 \text{ V}$ $V_{BE} = 0$ $V_{CE} = 120 \text{ V}$ $V_{BE} = 0$ $V_{CE} = 140 \text{ V}$ $V_{BE} = 0$	TIP33 TIP33A TIP33B TIP33C		0.4 0.4 0.4 0.4	mA
I_{CEO} Collector cut-off current	$V_{CE} = 30 \text{ V}$ $I_B = 0$ $V_{CE} = 60 \text{ V}$ $I_B = 0$	TIP33/33A TIP33B/33C		0.7 0.7	mA
I_{EBO} Emitter cut-off current	$V_{EB} = 5 \text{ V}$ $I_C = 0$			1	mA
h_{FE} Forward current transfer ratio	$V_{CE} = 4 \text{ V}$ $I_C = 1 \text{ A}$ $V_{CE} = 4 \text{ V}$ $I_C = 3 \text{ A}$	(see Notes 5 and 6)	40 20		
$V_{CE(sat)}$ Collector-emitter saturation voltage	$I_B = 0.3 \text{ A}$ $I_C = 3 \text{ A}$ $I_B = 2.5 \text{ A}$ $I_C = 10 \text{ A}$	(see Notes 5 and 6)		1 4	V
V_{BE} Base-emitter voltage	$V_{CE} = 4 \text{ V}$ $I_C = 3 \text{ A}$ $V_{CE} = 4 \text{ V}$ $I_C = 10 \text{ A}$	(see Notes 5 and 6)		1.6 3	V
h_{fe} Small signal forward current transfer ratio	$V_{CE} = 10 \text{ V}$ $I_C = 0.5 \text{ A}$ $f = 1 \text{ kHz}$		20		
$ h_{fe} $ Small signal forward current transfer ratio	$V_{CE} = 10 \text{ V}$ $I_C = 0.5 \text{ A}$ $f = 1 \text{ MHz}$		3		

NOTES: 5. These parameters must be measured using pulse techniques, $t_p = 300 \mu\text{s}$, duty cycle $\leq 2\%$.

6. These parameters must be measured using voltage-sensing contacts, separate from the current carrying contacts.

thermal characteristics

PARAMETER	MIN	TYP	MAX	UNIT
$R_{\theta JC}$ Junction to case thermal resistance			1.56	°C/W
$R_{\theta JA}$ Junction to free air thermal resistance			35.7	°C/W

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

PARAMETER	TEST CONDITIONS †	MIN	TYP	MAX	UNIT
t_{on} Turn-on time	$I_C = 6 \text{ A}$ $I_{B(on)} = 0.6 \text{ A}$ $I_{B(off)} = -0.6 \text{ A}$		0.6		μs
t_{off} Turn-off time	$V_{BE(off)} = -4 \text{ V}$ $R_L = 5 \Omega$ $t_p = 20 \mu\text{s}$, dc $\leq 2\%$		1		μs

† Voltage and current values shown are nominal; exact values vary slightly with transistor parameters.

TIP33, TIP33A, TIP33B, TIP33C
NPN SILICON POWER TRANSISTORS

JULY 1968 - REVISED MAY 1995

TYPICAL CHARACTERISTICS

TYPICAL DC CURRENT GAIN

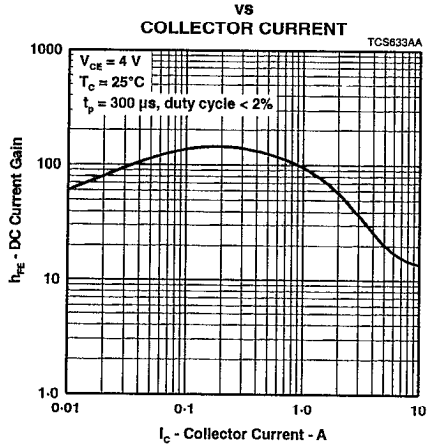


Figure 1.

COLLECTOR-EMITTER SATURATION VOLTAGE

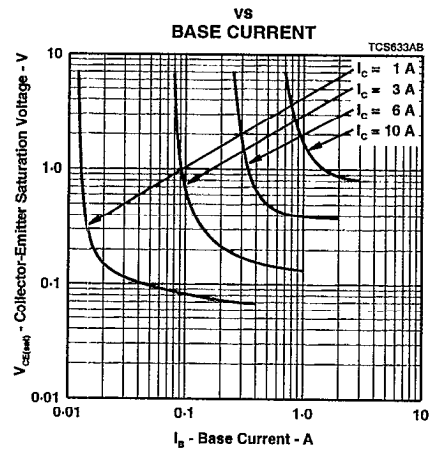


Figure 2.

BASE-EMITTER VOLTAGE

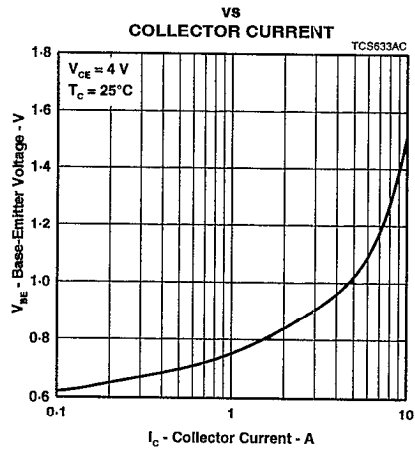
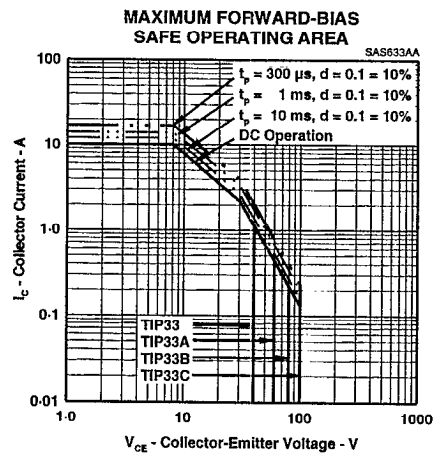


Figure 3.

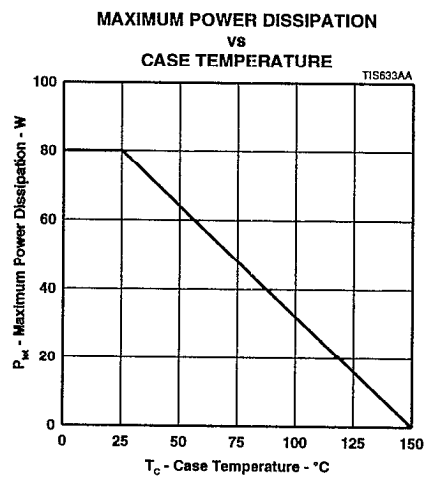
TIP33, TIP33A, TIP33B, TIP33C
NPN SILICON POWER TRANSISTORS

JULY 1968 - REVISED MAY 1995

MAXIMUM SAFE OPERATING REGIONS



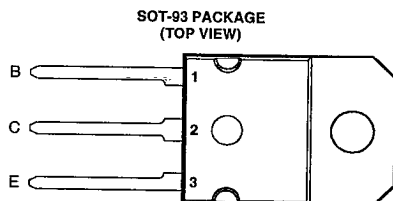
THERMAL INFORMATION



TIP34, TIP34A, TIP34B, TIP34C PNP SILICON POWER TRANSISTORS

JULY 1968 - REVISED MAY 1995

- Designed for Complementary Use with the TIP33 Series
- 80 W at 25°C Case Temperature
- 10 A Continuous Collector Current
- 15 A Peak Collector Current
- Customer-Specified Selections Available



Pin 2 is in electrical contact with the mounting base.

MDTRA

absolute maximum ratings at 25°C case temperature (unless otherwise noted)

RATING		SYMBOL	VALUE	UNIT
Collector-base voltage ($I_E = 0$)	TIP34	V_{CBO}	-80	V
	TIP34A		-100	
	TIP34B		-120	
	TIP34C		-140	
Collector-emitter voltage ($I_B = 0$)	TIP34	V_{CEO}	-40	V
	TIP34A		-60	
	TIP34B		-80	
	TIP34C		-100	
Emitter-base voltage		V_{EBO}	-5	V
Continuous collector current		I_C	-10	A
Peak collector current (see Note 1)		I_{CM}	-15	A
Continuous base current		I_B	-3	A
Continuous device dissipation at (or below) 25°C case temperature (see Note 2)		P_{tot}	80	W
Continuous device dissipation at (or below) 25°C free air temperature (see Note 3)		P_{tot}	3.5	W
Unclamped inductive load energy (see Note 4)		$\frac{1}{2}LI_C^2$	62.5	mJ
Operating junction temperature range		T_J	-65 to +150	°C
Storage temperature range		T_{stg}	-65 to +150	°C
Lead temperature 3.2 mm from case for 10 seconds		T_L	250	°C

- NOTES: 1. This value applies for $t_p \leq 0.3$ ms, duty cycle $\leq 10\%$.
2. Derate linearly to 150°C case temperature at the rate of 0.64 W/°C.
3. Derate linearly to 150°C free air temperature at the rate of 28 mW/°C.
4. This rating is based on the capability of the transistor to operate safely in a circuit of: $L = 20$ mH, $I_{B(on)} = -0.4$ A, $R_{BE} = 100 \Omega$, $V_{BE(on)} = 0$, $R_S = 0.1 \Omega$, $V_{CC} = -20$ V.

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 **TEXAS
INSTRUMENTS**

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TIP34, TIP34A, TIP34B, TIP34C PNP SILICON POWER TRANSISTORS

JULY 1968 - REVISED MAY 1995

electrical characteristics at 25°C case temperature

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
$V_{(BR)CEO}$ Collector-emitter breakdown voltage	$I_C = -30 \text{ mA}$ (see Note 5) $I_B = 0$	TIP34 -40 TIP34A -60 TIP34B -80 TIP34C -100			V
I_{CES} Collector-emitter cut-off current	$V_{CE} = -80 \text{ V}$ $V_{CE} = -100 \text{ V}$ $V_{CE} = -120 \text{ V}$ $V_{CE} = -140 \text{ V}$ $V_{BE} = 0$ $V_{BE} = 0$ $V_{BE} = 0$ $V_{BE} = 0$	TIP34 -0.4 TIP34A -0.4 TIP34B -0.4 TIP34C -0.4			mA
I_{CEO} Collector cut-off current	$V_{CE} = -30 \text{ V}$ $V_{CE} = -60 \text{ V}$ $I_B = 0$ $I_B = 0$	TIP34/34A -0.7 TIP34B/34C -0.7			mA
I_{EBO} Emitter cut-off current	$V_{EB} = -5 \text{ V}$ $I_C = 0$			-1	mA
h_{FE} Forward current transfer ratio	$V_{CE} = -4 \text{ V}$ $V_{CE} = -4 \text{ V}$ $I_C = -1 \text{ A}$ $I_C = -3 \text{ A}$	(see Notes 5 and 6) 40 20		100	
$V_{CE(sat)}$ Collector-emitter saturation voltage	$I_B = -0.3 \text{ A}$ $I_B = -2.5 \text{ A}$ $I_C = -3 \text{ A}$ $I_C = -10 \text{ A}$	(see Notes 5 and 6)		-1 -4	V
V_{BE} Base-emitter voltage	$V_{CE} = -4 \text{ V}$ $V_{CE} = -4 \text{ V}$ $I_C = -3 \text{ A}$ $I_C = -10 \text{ A}$	(see Notes 5 and 6)		-1.6 -3	V
h_{ie} Small signal forward current transfer ratio	$V_{CE} = -10 \text{ V}$ $I_C = -0.5 \text{ A}$ $f = 1 \text{ kHz}$	20			
$ h_{ie} $ Small signal forward current transfer ratio	$V_{CE} = -10 \text{ V}$ $I_C = -0.5 \text{ A}$ $f = 1 \text{ MHz}$	3			

NOTES: 5. These parameters must be measured using pulse techniques, $t_p = 300 \mu\text{s}$, duty cycle $\leq 2\%$.

6. These parameters must be measured using voltage-sensing contacts, separate from the current carrying contacts.

thermal characteristics

PARAMETER	MIN	TYP	MAX	UNIT
$R_{\theta JC}$ Junction to case thermal resistance			1.56	°C/W
$R_{\theta JA}$ Junction to free air thermal resistance			35.7	°C/W

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

PARAMETER	TEST CONDITIONS †	MIN	TYP	MAX	UNIT
t_{on} Turn-on time	$I_C = -6 \text{ A}$ $I_{B(on)} = -0.6 \text{ A}$ $I_{B(off)} = 0.6 \text{ A}$		0.4		μs
t_{off} Turn-off time	$V_{BE(off)} = 4 \text{ V}$ $R_L = 5 \Omega$ $t_p = 20 \mu\text{s}$, dc $\leq 2\%$		0.7		μs

† Voltage and current values shown are nominal; exact values vary slightly with transistor parameters.

TIP34, TIP34A, TIP34B, TIP34C PNP SILICON POWER TRANSISTORS

JULY 1968 - REVISED MAY 1995

TYPICAL CHARACTERISTICS

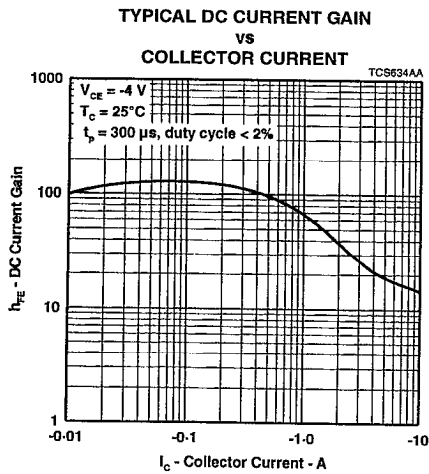


Figure 1.

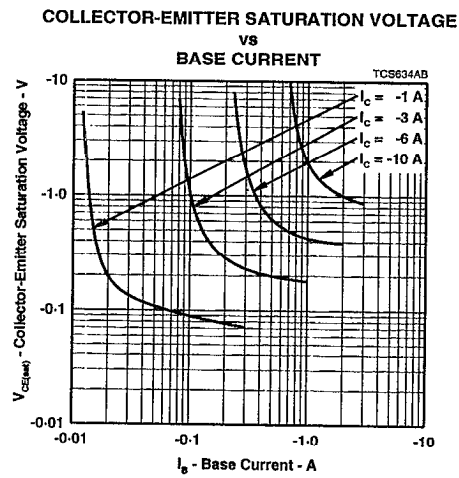


Figure 2.

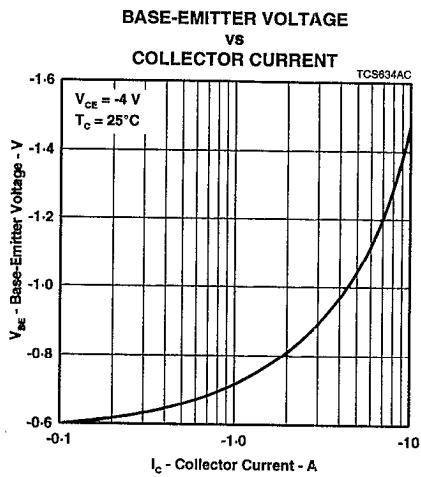


Figure 3.

TIP34, TIP34A, TIP34B, TIP34C
PNP SILICON POWER TRANSISTORS

JULY 1968 - REVISED MAY 1995

MAXIMUM SAFE OPERATING REGIONS

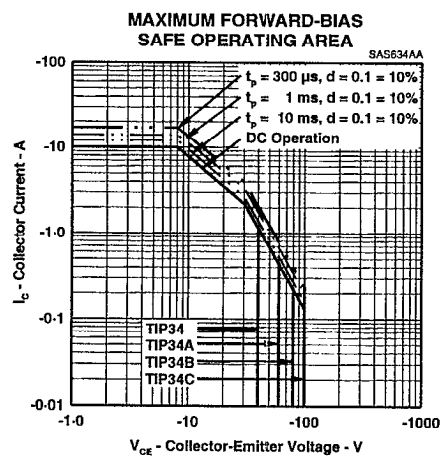


Figure 4.

THERMAL INFORMATION

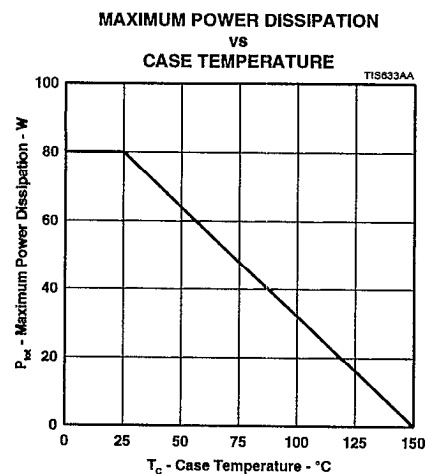
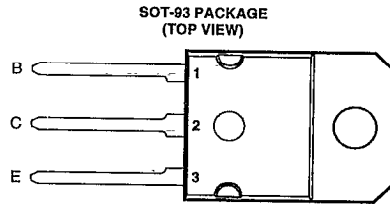


Figure 5.

TIP35, TIP35A, TIP35B, TIP35C NPN SILICON POWER TRANSISTORS

JULY 1968 - REVISED MAY 1995

- Designed for Complementary Use with the TIP36 Series
- 125 W at 25°C Case Temperature
- 25 A Continuous Collector Current
- 40 A Peak Collector Current
- Customer-Specified Selections Available



Pin 2 is in electrical contact with the mounting base.

MDTRA4

absolute maximum ratings at 25°C case temperature (unless otherwise noted)

RATING		SYMBOL	VALUE	UNIT
Collector-base voltage ($I_E = 0$)	TIP35	V_{CBO}	80	V
	TIP35A		100	
	TIP35B		120	
	TIP35C		140	
Collector-emitter voltage ($I_B = 0$)	TIP35	V_{CEO}	40	V
	TIP35A		60	
	TIP35B		80	
	TIP35C		100	
Emitter-base voltage		V_{EB0}	5	V
Continuous collector current		I_C	25	A
Peak collector current (see Note 1)		I_{CM}	40	A
Continuous base current		I_B	5	A
Continuous device dissipation at (or below) 25°C case temperature (see Note 2)		P_{tot}	125	W
Continuous device dissipation at (or below) 25°C free air temperature (see Note 3)		P_{tot}	3.5	W
Unclamped inductive load energy (see Note 4)		$\frac{1}{2}LI_C^2$	90	mJ
Operating junction temperature range		T_J	-65 to +150	°C
Storage temperature range		T_{stg}	-65 to +150	°C
Lead temperature 3.2 mm from case for 10 seconds		T_L	250	°C

- NOTES: 1. This value applies for $t_p \leq 0.3$ ms, duty cycle $\leq 10\%$.
2. Derate linearly to 150°C case temperature at the rate of 1 W/°C.
3. Derate linearly to 150°C free air temperature at the rate of 28 mW/°C.
4. This rating is based on the capability of the transistor to operate safely in a circuit of: $L = 20$ mH, $I_{B(on)} = 0.4$ A, $R_{BE} = 100 \Omega$, $V_{BE(off)} = 0$, $R_S = 0.1 \Omega$, $V_{CC} = 20$ V.

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**TEXAS
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TIP35, TIP35A, TIP35B, TIP35C NPN SILICON POWER TRANSISTORS

JULY 1968 - REVISED MAY 1995

electrical characteristics at 25°C case temperature

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
$V_{(BR)CEO}$ Collector-emitter breakdown voltage	$I_C = 30 \text{ mA}$ (see Note 5) $I_B = 0$	TIP35 40 TIP35A 60 TIP35B 80 TIP35C 100			V
I_{CES} Collector-emitter cut-off current	$V_{CE} = 80 \text{ V}$ $V_{BE} = 0$ $V_{CE} = 100 \text{ V}$ $V_{BE} = 0$ $V_{CE} = 120 \text{ V}$ $V_{BE} = 0$ $V_{CE} = 140 \text{ V}$ $V_{BE} = 0$	TIP35 TIP35A TIP35B TIP35C		0.7 0.7 0.7 0.7	mA
I_{CEO} Collector cut-off current	$V_{CE} = 30 \text{ V}$ $I_B = 0$ $V_{CE} = 60 \text{ V}$ $I_B = 0$	TIP35/35A TIP35B/35C		1 1	mA
I_{EBO} Emitter cut-off current	$V_{EB} = 5 \text{ V}$ $I_C = 0$			1	mA
h_{FE} Forward current transfer ratio	$V_{CE} = 4 \text{ V}$ $I_C = 1.5 \text{ A}$ $V_{CE} = 4 \text{ V}$ $I_C = 15 \text{ A}$	(see Notes 5 and 6) 25 10		50	
$V_{CE(sat)}$ Collector-emitter saturation voltage	$I_B = 1.5 \text{ A}$ $I_C = 15 \text{ A}$ $I_B = 5 \text{ A}$ $I_C = 25 \text{ A}$	(see Notes 5 and 6)		1.8 4	V
V_{BE} Base-emitter voltage	$V_{CE} = 4 \text{ V}$ $I_C = 15 \text{ A}$ $V_{CE} = 4 \text{ V}$ $I_C = 25 \text{ A}$	(see Notes 5 and 6)		2 4	V
h_{ie} Small signal forward current transfer ratio	$V_{CE} = 10 \text{ V}$ $I_C = 1 \text{ A}$ $f = 1 \text{ kHz}$	25			
$ h_{ie} $ Small signal forward current transfer ratio	$V_{CE} = 10 \text{ V}$ $I_C = 1 \text{ A}$ $f = 1 \text{ MHz}$	3			

NOTES: 5. These parameters must be measured using pulse techniques, $t_p = 300 \mu\text{s}$, duty cycle $\leq 2\%$.

6. These parameters must be measured using voltage-sensing contacts, separate from the current carrying contacts.

thermal characteristics

PARAMETER	MIN	TYP	MAX	UNIT
$R_{\theta JC}$ Junction to case thermal resistance			1	°C/W
$R_{\theta JA}$ Junction to free air thermal resistance			35.7	°C/W

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

PARAMETER	TEST CONDITIONS †	MIN	TYP	MAX	UNIT
t_{on} Turn-on time	$I_C = 15 \text{ A}$ $I_{B(on)} = 1.5 \text{ A}$ $I_{B(off)} = -1.5 \text{ A}$		1.2		μs
t_{off} Turn-off time	$V_{BE(off)} = -4.15 \text{ V}$ $R_L = 2 \Omega$ $t_p = 20 \mu\text{s}$, $dc \leq 2\%$		0.9		μs

† Voltage and current values shown are nominal; exact values vary slightly with transistor parameters.

TIP35, TIP35A, TIP35B, TIP35C NPN SILICON POWER TRANSISTORS

JULY 1968 - REVISED MAY 1995

TYPICAL CHARACTERISTICS

TYPICAL DC CURRENT GAIN
vs
COLLECTOR CURRENT

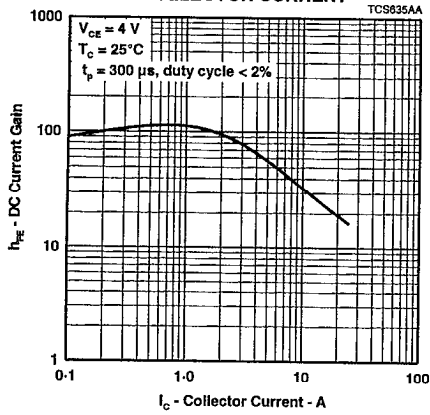


Figure 1.

COLLECTOR-EMITTER SATURATION VOLTAGE
vs
BASE CURRENT

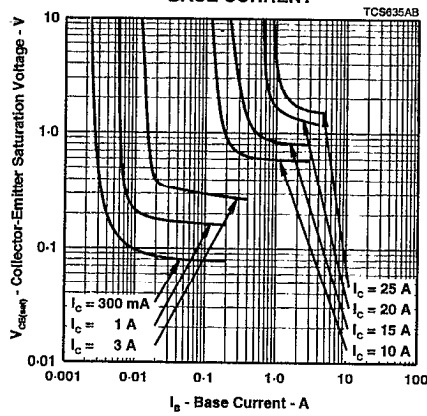


Figure 2.

BASE-EMITTER VOLTAGE
vs
COLLECTOR CURRENT

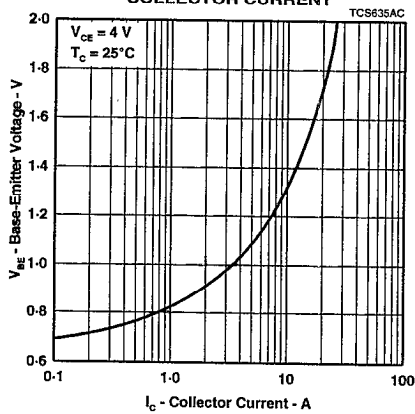


Figure 3.

TIP35, TIP35A, TIP35B, TIP35C
NPN SILICON POWER TRANSISTORS

JULY 1968 - REVISED MAY 1995

MAXIMUM SAFE OPERATING REGIONS

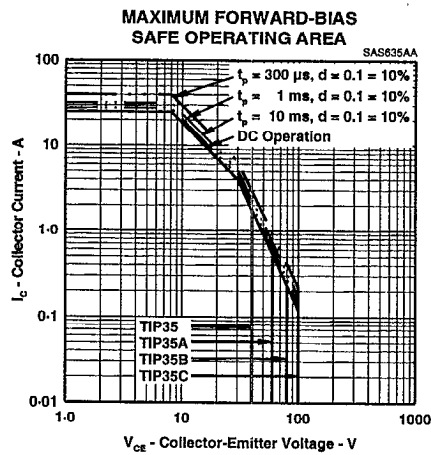


Figure 4.

THERMAL INFORMATION

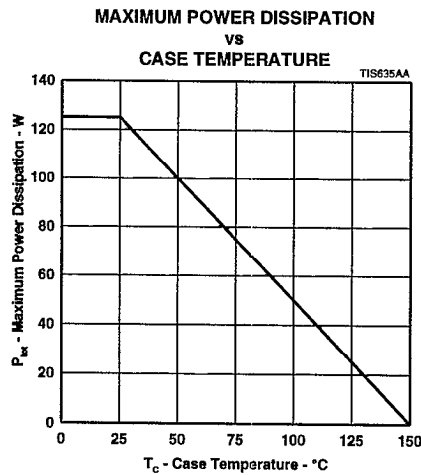
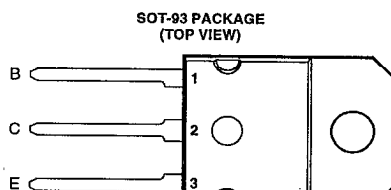


Figure 5.

TIP36, TIP36A, TIP36B, TIP36C PNP SILICON POWER TRANSISTORS

JULY 1968 - REVISED MAY 1995

- Designed for Complementary Use with the TIP35 Series
- 125 W at 25°C Case Temperature
- 25 A Continuous Collector Current
- 40 A Peak Collector Current
- Customer-Specified Selections Available



Pin 2 is in electrical contact with the mounting base.

MDTRAA

absolute maximum ratings at 25°C case temperature (unless otherwise noted)

RATING		SYMBOL	VALUE	UNIT
Collector-base voltage ($I_E = 0$)	TIP36	V_{CBO}	-80	V
	TIP36A		-100	
	TIP36B		-120	
	TIP36C		-140	
Collector-emitter voltage ($I_B = 0$)	TIP36	V_{CEO}	-40	V
	TIP36A		-60	
	TIP36B		-80	
	TIP36C		-100	
Emitter-base voltage		V_{EBO}	-5	V
Continuous collector current		I_C	-25	A
Peak collector current (see Note 1)		I_{CM}	-40	A
Continuous base current		I_B	-5	A
Continuous device dissipation at (or below) 25°C case temperature (see Note 2)		P_{tot}	125	W
Continuous device dissipation at (or below) 25°C free air temperature (see Note 3)		P_{tot}	3.5	W
Unclamped inductive load energy (see Note 4)		$\frac{1}{2}LI_C^2$	90	mJ
Operating junction temperature range		T_J	-65 to +150	°C
Storage temperature range		T_{stg}	-65 to +150	°C
Lead temperature 3.2 mm from case for 10 seconds		T_L	250	°C

- NOTES: 1. This value applies for $I_B \leq 0.3$ ms, duty cycle $\leq 10\%$.
2. Derate linearly to 150°C case temperature at the rate of 1 W/°C.
3. Derate linearly to 150°C free air temperature at the rate of 28 mW/°C.
4. This rating is based on the capability of the transistor to operate safely in a circuit of: $L = 20$ mH, $I_{B(on)} = -0.4$ A, $R_{BE} = 100 \Omega$, $V_{BE(off)} = 0$, $R_S = 0.1 \Omega$, $V_{CC} = -20$ V.

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TIP36, TIP36A, TIP36B, TIP36C PNP SILICON POWER TRANSISTORS

JULY 1968 - REVISED MAY 1995

electrical characteristics at 25°C case temperature

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
$V_{(BR)CEO}$ Collector-emitter breakdown voltage	$I_C = -30 \text{ mA}$ (see Note 5) $I_B = 0$	TIP36 -40 TIP36A -60 TIP36B -80 TIP36C -100			V
I_{CES} Collector-emitter cut-off current	$V_{CE} = -80 \text{ V}$ $V_{BE} = 0$ $V_{CE} = -100 \text{ V}$ $V_{BE} = 0$ $V_{CE} = -120 \text{ V}$ $V_{BE} = 0$ $V_{CE} = -140 \text{ V}$ $V_{BE} = 0$	TIP36 -0.7 TIP36A -0.7 TIP36B -0.7 TIP36C -0.7			mA
I_{CEO} Collector cut-off current	$V_{CE} = -30 \text{ V}$ $I_B = 0$ $V_{CE} = -60 \text{ V}$ $I_B = 0$	TIP36/36A -1 TIP36B/36C -1			mA
I_{EBO} Emitter cut-off current	$V_{EB} = -5 \text{ V}$ $I_C = 0$			-1	mA
h_{FE} Forward current transfer ratio	$V_{CE} = -4 \text{ V}$ $I_C = -1.5 \text{ A}$ $V_{CE} = -4 \text{ V}$ $I_C = -15 \text{ A}$	(see Notes 5 and 6) 25 10		50	
$V_{CE(sat)}$ Collector-emitter saturation voltage	$I_B = -1.5 \text{ A}$ $I_C = -15 \text{ A}$ $I_B = -5 \text{ A}$ $I_C = -25 \text{ A}$	(see Notes 5 and 6)		-1.8 -4	V
V_{BE} Base-emitter voltage	$V_{CE} = -4 \text{ V}$ $I_C = -15 \text{ A}$ $V_{CE} = -4 \text{ V}$ $I_C = -25 \text{ A}$	(see Notes 5 and 6)		-2 -4	V
h_{fe} Small signal forward current transfer ratio	$V_{CE} = -10 \text{ V}$ $I_C = -1 \text{ A}$ $f = 1 \text{ kHz}$	25			
$ h_{fe} $ Small signal forward current transfer ratio	$V_{CE} = -10 \text{ V}$ $I_C = -1 \text{ A}$ $f = 1 \text{ MHz}$	3			

NOTES: 5. These parameters must be measured using pulse techniques, $t_p = 300 \mu\text{s}$, duty cycle $\leq 2\%$.

6. These parameters must be measured using voltage-sensing contacts, separate from the current carrying contacts.

thermal characteristics

PARAMETER	MIN	TYP	MAX	UNIT
$R_{\theta JC}$ Junction to case thermal resistance			1	°C/W
$R_{\theta JA}$ Junction to free air thermal resistance			35.7	°C/W

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

PARAMETER	TEST CONDITIONS †	MIN	TYP	MAX	UNIT
t_{on} Turn-on time	$I_C = -15 \text{ A}$ $I_{B(on)} = -1.5 \text{ A}$ $I_{B(off)} = 1.5 \text{ A}$		1.1		μs
t_{off} Turn-off time	$V_{BE(off)} = 4.15 \text{ V}$ $R_L = 2 \Omega$ $t_p = 20 \mu\text{s}$, dc $\leq 2\%$		0.8		μs

† Voltage and current values shown are nominal; exact values vary slightly with transistor parameters.

TIP36, TIP36A, TIP36B, TIP36C
PNP SILICON POWER TRANSISTORS

JULY 1968 - REVISED MAY 1995

TYPICAL CHARACTERISTICS

TYPICAL DC CURRENT GAIN
vs
COLLECTOR CURRENT

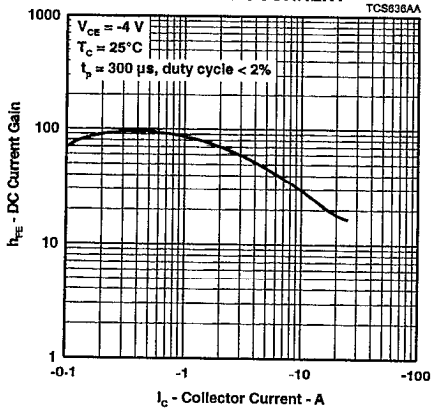


Figure 1.

COLLECTOR-EMITTER SATURATION VOLTAGE
vs
BASE CURRENT

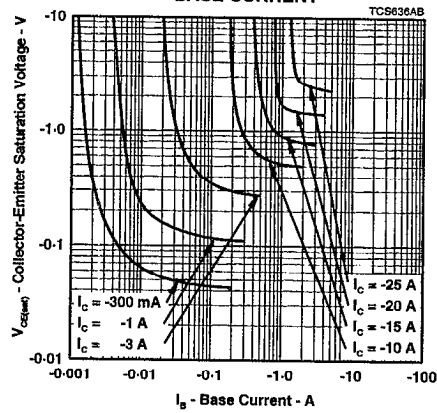


Figure 2.

BASE-EMITTER VOLTAGE
vs
COLLECTOR CURRENT

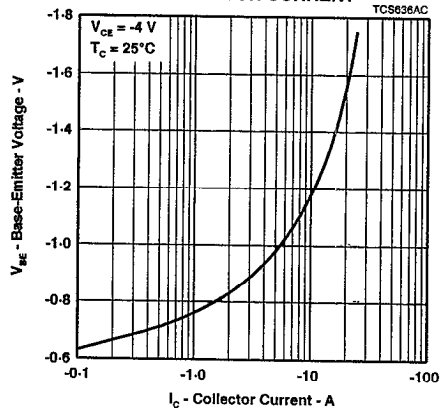


Figure 3.

TIP36, TIP36A, TIP36B, TIP36C
PNP SILICON POWER TRANSISTORS

JULY 1968 - REVISED MAY 1995

MAXIMUM SAFE OPERATING REGIONS

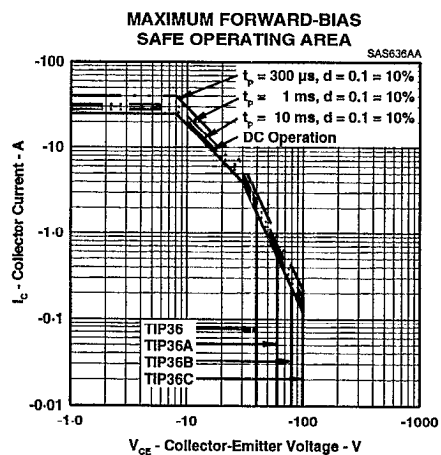


Figure 4.

THERMAL INFORMATION

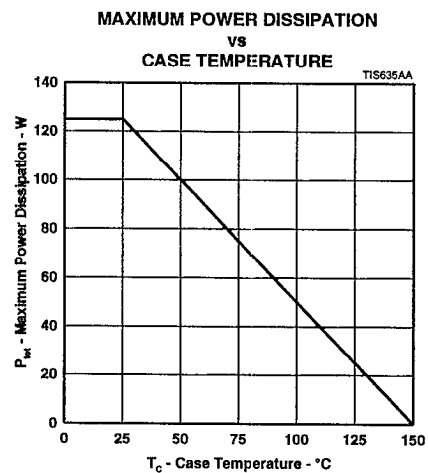


Figure 5.