

NPN MEDIUM POWER TRANSISTORS

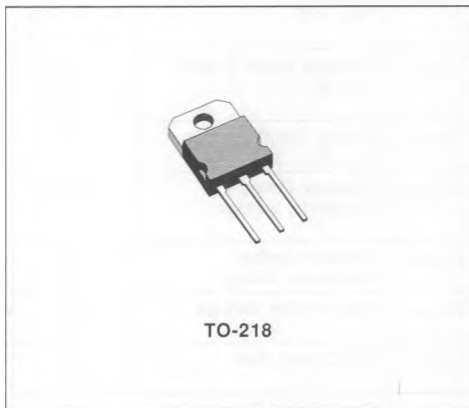
ADVANCE DATA

- 10A RATED COLLECTOR CURRENT
- HIGH SPEED SWITCHING

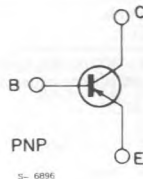
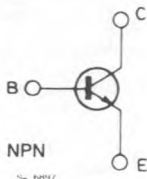
DESCRIPTION

The TIP33A, TIP33B and TIP33C are silicon epitaxial base NPN power transistors in TO-218 plastic package intended for use in linear and switching applications.

The complementary PNP types are TIP34A, TIP34B and TIP34C respectively.



INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	NPN PNP	Value			Unit
			TIP33A TIP34A	TIP33B TIP34B	TIP33C TIP34C	
V_{CBO}	Collector-base Voltage	$I_E = 0$	100	120	140	V
V_{CES}	Collector-emitter Voltage	$V_{BE} = 0$	100	120	140	V
V_{CEO}	Collector-emitter Voltage	$I_B = 0$	60	80	100	V
V_{EBO}	Emitter-base Voltage	$I_C = 0$	7			V
I_C	Collector Current		10			A
I_{CM}	Collector Peak Current $t_p < ?ms$		12			A
I_B	Base Current		3			A
P_{tot}	Total Dissipation at $T_c < 25^\circ C$		80			W
T_{stg}	Storage Temperature		- 65 to 150			$^\circ C$
T_j	Max. Operating Junction Temperature		150			$^\circ C$

For PNP types voltage and current values are negative.

THERMAL DATA

$R_{thj-case}$	Thermal Resistance Junction-case	max	1.56	C/W
----------------	----------------------------------	-----	------	-----

ELECTRICAL CHARACTERISTICS ($T_{case} = 25^{\circ}C$ unless otherwise specified)

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I_{CES}	Collector Cutoff Current ($V_{BE} = 0$)	$V_{CE} = 100V$ $V_{CE} = 120V$ $V_{CE} = 140V$	for TIP33A/34A for TIP33B/34B for TIP33C/34C			400 400 400	μA μA μA
I_{CEO}	Collector Cutoff Current ($I_B = 0$)	$V_{CE} = 30V$ $V_{CE} = 60V$ $V_{CE} = 60V$	for TIP33A/34A for TIP33B/34B for TIP33C/34C			0.7 0.7 0.7	mA mA mA
I_{EBO}	Emitter Cutoff Current ($I_C = 0$)	$V_{EB} = 5V$				1	mA
$V_{CEO(sus)}$	Collector Emitter Sustaining Voltage	$I_C = 30mA$	for TIP33A/34A for TIP33B/34B for TIP33C/34C	60 80 100			V V V
$V_{CE(sat)}$	Collector-emitter Saturation Voltage	$I_C = 3A$ $I_C = 10A$	$I_B = 0.3A$ $I_B = 2.5A$			1 4	V V
$V_{BE(on)}$	Base-emitter Voltage	$I_C = 3A$ $I_C = 10A$	$V_{CE} = 4V$ $V_{CE} = 4V$			1.6 3	V V
h_{FE}^*	DC Current Gain	$I_C = 1A$ $I_C = 3A$	$V_{CE} = 4V$ $V_{CE} = 4V$	40 20		100	
h_{fe}	Small Signal Current Gain	$I_C = 0.5A$	$V_{CE} = 10V$ $f = 1kHz$	20			
f_T	Transition Frequency	$I_C = 0.5A$	$V_{CE} = 10V$ $f = 1MHz$	3			MHz
t_{on} t_s t_f	RESISTIVE LOAD Turn-on Time Storage Time Fall Time	$V_{CC} = 30V$ $V_{BB} = -6V$ $t_p = 20\mu s$	$I_C = 6A$ $I_{B1} = -I_{B2} = 0.6A$		0.6 0.4 1		μs μs μs

* Pulsed : pulse duration = 300 μs , duty cycle = 1.5%.

For PNP types voltage and current values are negative.