

## NPN MEDIUM POWER TRANSISTORS

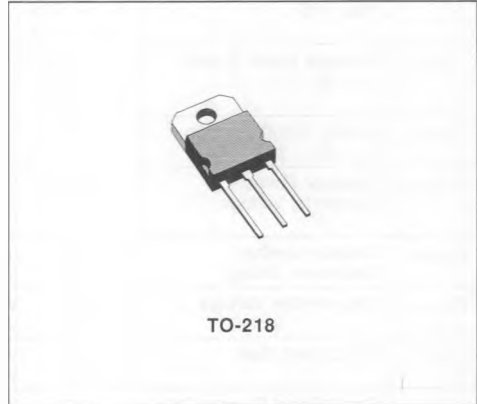
ADVANCE DATA

- 10A RATED COLLECTOR CURRENT
- HIGH SPEED SWITCHING

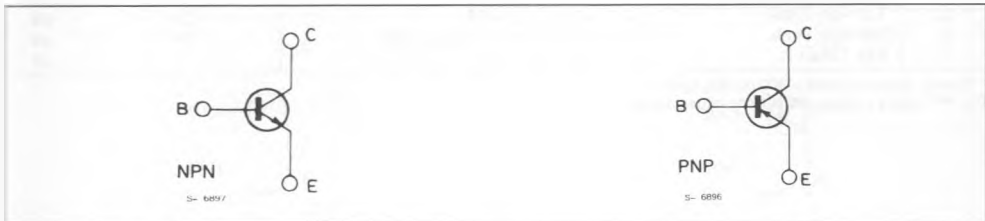
### DESCRIPTION

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
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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	$\mu A$ $\mu A$ $\mu A$
$I_{CEO}$	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
$V_{CE0(sus)}$	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		$\mu s$ $\mu s$ $\mu s$

\* Pulsed : pulse duration = 300 $\mu s$ , duty cycle = 1.5%.  
For PNP types voltage and current values are negative.