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**TIP33A, TIP34A
 TIP33B, TIP34B
 TIP33C, TIP34C
 Silicon Complementary High-Power Transistors
 TO247 Type Package**

Description:

The TIP33 (NPN) and TIP34 (PNP) series complementary high-power transistors are designed for use in general purpose power amplifier and switching applications.

Features:

- Collector-Emitter Sustaining Voltage:
 $V_{CEO(sus)} = 60V$ Min (TIP33A, TIP34A)
 $80V$ Min (TIP33B, TIP34B)
 $100V$ Min (TIP33C, TIP34C)
- DC Current Gain: $h_{FE} = 40$ Min @ $I_C = 1.0A$
- Current Gain-Bandwidth Product: $f_T = 3Mhz$ Min @ $I_C = 0.5A$

Absolute Maximum Ratings:

Collector-Emitter Voltage, V_{CEO}	
TIP33A, TIP34A	60V
TIP33B, TIP34B	80V
TIP33C, TIP34C	100V
Collector-Base Voltage, V_{CBO}	
TIP33A, TIP34A	60V
TIP33B, TIP34B	80V
TIP33C, TIP34C	100V
Emitter-Base Voltage, V_{EBO}	5V
Collector Current, I_C	
Continuous	10A
Peak	15A
Base Current, I_B	3A
Total Power Dissipation ($T_C = +25^\circ C$), P_D	80W
Derate Above $+25^\circ C$	0.64W/ $^\circ C$
Operating Junction Temperature Range, T_J	-65° to $+150^\circ C$
Storage Temperature Range, T_{stg}	-65° to $+150^\circ C$
Thermal Resistance, Junction-to-Case, R_{thJC}	1.56 $^\circ C/W$

Electrical Characteristics: ($T_C = +25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Collector-Emitter Sustaining Voltage TIP33A, TIP34A TIP33B, TIP34B TIP33C, TIP34C	$V_{CE(sus)}$	$I_C = 30\text{mA}, I_B = 0$, Note 1	60	-	-	V
			80	-	-	V
			100	-	-	V
Collector Cutoff Current TIP33A, TIP34A TIP33B, TIP34B, TIP33C, TIP34C	I_{CEO}	$V_{CE} = 30\text{V}, I_B = 0$	-	-	0.7	mA
		$V_{CE} = 60\text{V}, I_B = 0$	-	-	0.7	mA
Collector Cutoff Current TIP33A, TIP34A TIP33B, TIP34B TIP33C, TIP34C	I_{CES}	$V_{CE} = 60\text{V}, V_{EB} = 0$	-	-	0.4	mA
		$V_{CE} = 80\text{V}, V_{EB} = 0$	-	-	0.4	mA
		$V_{CE} = 100\text{V}, V_{EB} = 0$	-	-	0.4	mA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 5\text{V}, I_C = 0$	-	-	1.0	mA
ON Characteristics (Note 1)						
DC Current Gain	h_{FE}	$V_{CE} = 4\text{V}, I_B = 1.0\text{A}$	40	-	-	
		$V_{CE} = 4\text{V}, I_B = 3.0\text{A}$	20	-	100	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 3\text{A}, I_B = 0.3\text{A}$	-	-	1.0	V
		$I_C = 10\text{A}, I_B = 2.5\text{A}$	-	-	4.0	V
Base-Emitter ON Voltage	$V_{BE(on)}$	$I_C = 3\text{A}, V_{CE} = 4\text{V}$	-	-	1.6	V
		$I_C = 10\text{A}, V_{CE} = 4\text{V}$	-	-	3.0	V
Dynamic Characteristics						
Current Gain-Bandwidth Product	f_T	$I_C = 0.5\text{A}, V_{CE} = 10\text{V}, f_{TEST} = 1\text{MHz}$, Note 2	3.0	-	-	MHz
Small Signal Current Gain	h_{fe}	$I_C = 0.5\text{A}, V_{CE} = 10\text{V}, f = 1\text{kHz}$	20	-	-	

Note 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.

Note 2. $f_T = |h_{fe}| \cdot f_{TEST}$

