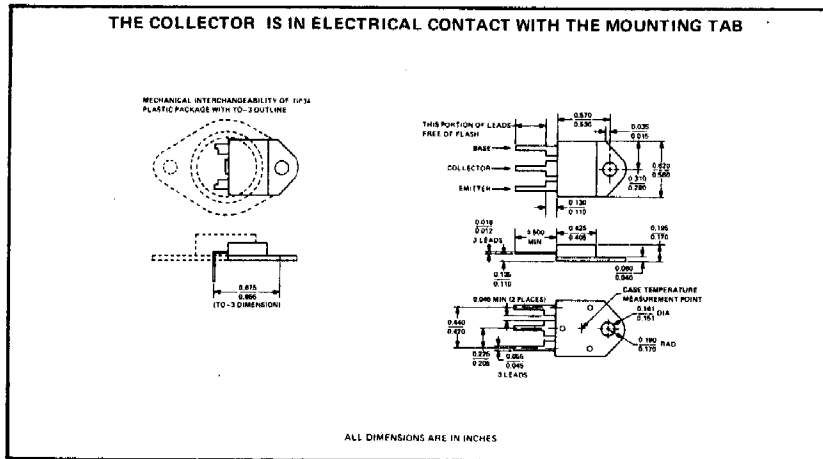


TYPES TIP34, TIP34A, TIP34B, TIP34C
P-N-P SINGLE-DIFFUSED MESA SILICON POWER TRANSISTORS

FOR POWER-AMPLIFIER AND HIGH-SPEED-SWITCHING APPLICATIONS
 DESIGNED FOR COMPLEMENTARY USE WITH TIP33, TIP33A, TIP33B, TIP33C

- 80 W at 25°C Case Temperature
- 10 A Rated Collector Current
- Min f_T of 3 MHz at 10 V, 500 mA

mechanical data



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

	TIP34	TIP34A	TIP34B	TIP34C
Collector-Base Voltage	-40 V	-60 V	-80 V	-100 V
Collector-Emitter Voltage (See Note 1)	-40 V	-60 V	-80 V	-100 V
Emitter-Base Voltage	← -5 V →			
Continuous Collector Current	← -10 A →			
Peak Collector Current (See Note 2)	← -15 A →			
Continuous Base Current	← -3 A →			
Safe Operating Region at (or below) 25°C Case Temperature	← See Figure 5 →			
Continuous Device Dissipation at (or below) 25°C Case Temperature (See Note 3)	← 80 W →			
Continuous Device Dissipation at (or below) 25°C Free-Air Temperature (See Note 4)	← 3.5 W →			
Unclamped Inductive Load Energy (See Note 5)	← 62.5 mJ →			
Operating Collector Junction Temperature Range	← -65°C to 150°C →			
Storage Temperature Range	← -65°C to 150°C →			
Lead Temperature 1/8 Inch from Case for 10 Seconds	← 260°C →			

- NOTES:
1. This value applies when the base-emitter diode is open circuited.
 2. This value applies for $t_W \leq 0.3$ ms, duty cycle $\leq 10\%$.
 3. Derate linearly to 150°C case temperature at the rate of 0.64 W/°C.
 4. Derate linearly to 150°C free-air temperature at the rate of 28 mW/°C.
 5. This rating is based on the capability of the transistor to operate safely in the circuit of Figure 2. $L = 20$ mH, $R_{BB2} = 100 \Omega$, $V_{BB2} = 0$ V, $R_S = 0.1 \Omega$, $V_{CC} = 10$ V. Energy $\approx 1/2 I_C^2 L/2$.



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TYPES TIP34, TIP34A, TIP34B, TIP34C P-N-P SINGLE-DIFFUSED MESA SILICON POWER TRANSISTORS

electrical characteristics at 25°C case temperature

PARAMETER	TEST CONDITIONS	TIP34		TIP34A		TIP34B		TIP34C		UNIT
		MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
$V_{(BR)CEO}$ Collector-Emitter Breakdown Voltage	$I_C = -30 \text{ mA}$, $I_B = 0$, See Note 6	-40		-60		-80		-100		V
I_{CEO} Collector Cutoff Current	$V_{CE} = -30 \text{ V}$, $I_B = 0$	-0.7		-0.7						mA
	$V_{CE} = -60 \text{ V}$, $I_B = 0$					-0.7		-0.7		
I_{CES} Collector Cutoff Current	$V_{CE} = -40 \text{ V}$, $V_{BE} = 0$	-0.4								mA
	$V_{CE} = -60 \text{ V}$, $V_{BE} = 0$			-0.4						
	$V_{CE} = -80 \text{ V}$, $V_{BE} = 0$					-0.4				
	$V_{CE} = -100 \text{ V}$, $V_{BE} = 0$							-0.4		
I_{EBO} Emitter Cutoff Current	$V_{EB} = -5 \text{ V}$, $I_C = 0$	-1		-1		-1		-1		mA
h_{FE} Static Forward Current Transfer Ratio	$V_{CE} = -4 \text{ V}$, $I_C = -1 \text{ A}$, See Notes 6 and 7	40		40		40		40		
	$V_{CE} = -4 \text{ V}$, $I_C = -3 \text{ A}$, See Notes 6 and 7	20	100	20	100	20	100	20	100	
V_{BE} Base-Emitter Voltage	$V_{CE} = -4 \text{ V}$, $I_C = -3 \text{ A}$, See Notes 6 and 7	-1.6		-1.6		-1.6		-1.6		V
	$V_{CE} = -4 \text{ V}$, $I_C = -10 \text{ A}$, See Notes 6 and 7	-3		-3		-3		-3		
$V_{CE(sat)}$ Collector-Emitter Saturation Voltage	$I_B = -0.3 \text{ A}$, $I_C = -3 \text{ A}$, See Notes 6 and 7	-1		-1		-1		-1		V
	$I_B = -2.5 \text{ A}$, $I_C = -10 \text{ A}$, See Notes 6 and 7	-4		-4		-4		-4		
h_{fe} Small-Signal Common-Emitter Forward Current Transfer Ratio	$V_{CE} = -10 \text{ V}$, $I_C = -0.5 \text{ A}$, $f = 1 \text{ kHz}$	20		20		20		20		
$ h_{fe} $ Small-Signal Common-Emitter Forward Current Transfer Ratio	$V_{CE} = -10 \text{ V}$, $I_C = -0.5 \text{ A}$, $f = 1 \text{ MHz}$	3		3		3		3		

NOTES: 6. These parameters must be measured using pulse techniques. $t_W = 300 \mu\text{s}$, duty cycle $\leq 2\%$.

7. These parameters are measured with voltage-sensing contacts separate from the current-carrying contacts.

thermal characteristics

PARAMETER	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	

switching characteristics at 25°C case temperature

PARAMETER	TEST CONDITIONS†	TYP	UNIT
t_{on} Turn-On Time	$I_C = -6 \text{ A}$, $I_{B(1)} = -0.6 \text{ A}$, $I_{B(2)} = 0.6 \text{ A}$, $V_{BE(off)} = 4 \text{ V}$, $R_L = 5 \Omega$, See Figure 1	0.4	μs
t_{off} Turn-Off Time		0.7	

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