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## TIP141 Silicon NPN Transistor Darlington Power Amp, Switch TO-247 Type Package

**Description:**

The TIP141 is a silicon NPN Darlington transistor in a TO-247 type package designed for general purpose amplifier and low frequency switching applications.

**Features:**

- High DC Current Gain:  $h_{FE} = 1000$  (Min) at  $I_C = 5A$ ,  $V_{CE} = 4V$
- Collector-Emitter Sustaining Voltage:  $V_{CEO(sus)} = 80V$  (Min) at  $I_C = 30mA$

**Absolute Maximum Ratings:** (Note 1)

Collector-Emitter Voltage, $V_{CEO}$ .....	80V
Collector-Base Voltage, $V_{CB}$ .....	80V
Emitter-Base Voltage, $V_{EB}$ .....	5V
Collector Current, $I_C$	
Continuous .....	10A
Peak (Note 2) .....	15A
Base Current, $I_B$ .....	500mA
Total Power Dissipation ( $T_C = +25^\circ C$ ), $P_D$ .....	125W
Operating Junction Temperature Range, $T_J$ .....	$-65^\circ$ to $+150^\circ C$
Storage Temperature Range, $T_{stg}$ .....	$-65^\circ$ to $+150^\circ C$
Thermal Resistance, Junction-to-Case, $R_{thJC}$ .....	$1.0^\circ C/W$
Thermal Resistance, Junction-to-Ambient, $R_{thJA}$ .....	$35.7^\circ C/W$

Note 1. Stresses exceeding those listed in the Absolute Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damages may occur and reliability may be affected.

Note 2. 5ms,  $\leq 10\%$  Duty Cycle

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>OFF Characteristics</b>						
Collector-Emitter Sustaining Voltage	$V_{CEO(sus)}$	$I_C = 30mA$ , $I_B = 0$ , Note 3	80	-	-	V
Collector Cutoff Current	$I_{CBO}$	$V_{CB} = 80V$ , $I_E = 0$	-	-	1.0	mA
	$I_{CEO}$	$V_{CE} = 40V$ , $I_B = 0$	-	-	2.0	mA
Emitter Cutoff Current	$I_{EBO}$	$V_{BE} = 5V$	-	-	2	mA

Note 3. Pulse Test: Pulse Width =  $300\mu s$ , Duty Cycle  $\leq 2\%$ .

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>ON Characteristics (Note 3)</b>						
DC Current Gain	$h_{FE}$	$V_{CE} = 4\text{V}, I_C = 5\text{A}$	1000	-	-	
		$V_{CE} = 4\text{V}, I_C = 10\text{A}$	500	-	-	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 5\text{A}, I_B = 10\text{mA}$	-	-	2.0	V
		$I_C = 10\text{A}, I_B = 40\text{mA}$	-	-	3.0	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 10\text{A}, I_B = 40\text{mA}$	-	-	3.5	V
Base-Emitter On Voltage	$V_{BE(on)}$	$I_C = 10\text{A}, V_{CE} = 4\text{V}$	-	-	3.0	V
<b>Switching Characteristics</b>						
Delay Time	$t_d$	$V_{CC} = 30\text{V}, I_C = 5\text{A}, I_B = 20\text{mA},$ Duty Cycle $\leq 2\%$ , $I_{B1} = I_{B2},$ $R_C$ & $R_B$ Varied, $T_J = +25^\circ\text{C}$	-	0.15	-	$\mu\text{s}$
Rise Time	$t_r$		-	0.55	-	$\mu\text{s}$
Storage Time	$t_s$		-	2.5	-	$\mu\text{s}$
Fall Time	$t_f$		-	2.5	-	$\mu\text{s}$

Note 3. Pulse Test: Pulse Width =  $300\mu\text{s}$ , Duty Cycle  $\leq 2\%$ .

