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D40C7 Silicon NPN Transistor Darlington Power Amplifier TO-202 Type Package

Features:

- Forward Current Transfer Ratio: $h_{FE} = 10,000$ Min
- Power Dissipation: 1.33W Free-Air @ $T_A = +50^\circ\text{C}$
- Hard Solder Mountdown

Applications:

- Driver, IC Driver
- Regulator
- Touch Switch
- Audio Output
- Relay Substitute
- Oscillator
- Servo-Amplifier
- Capacitor Multiplier

Absolute Maximum Ratings: ($T_A = +25^\circ\text{C}$ unless otherwise specified)

Collector-to-Emitter Voltage, V_{CEO}	50V
Collector-to-Emitter Voltage, V_{CES}	50V
Emitter-to-Base Voltage, V_{EBO}	13V
Collector Current (Note 1), I_C	
Continuous	0.5A
Peak	1.0A
Power Dissipation, P_D	
$T_C = +25^\circ\text{C}$ (Note 2)	6.25W
$T_C = +70^\circ\text{C}$	4W
$T_A = +50^\circ\text{C}$	
With Tab	1.33W
Without Tab	1W
Thermal Resistance, Junction-to-Case (Note 2), R_{thJC}	20°C/W
Thermal Resistance, Junction-to-Ambient (Note 2), R_{thJA}	
With Tab	75°C/W
Without Tab	100°C/W
Operating Junction Temperature Range (Note 2), T_J	-55° to +150°C
Storage Temperature Range (Note 2), T_{stg}	-55° to +150°C
Lead Temperature (During Soldering, 1/16" from case, 10sec Max, Note 2), T_L	+260°C

Note 1. Pulse Test: Pulse Width = 25ms, Duty Cycle = 50%

Note 2. Tab temperature is measured on center of tab, 1/16" from plastic body.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Forward Current Transfer Ratio	h_{FE}	$I_C = 200\text{mA}, V_{CE} = 5\text{V}$	10k	–	60k	
	h_{fe}	$I_C = 20\text{mA}, V_{CE} = 5\text{V}, f = 1\text{kHz}$	–	10k	–	
Collector-to-Emitter Voltage	V_{CEO}	$I_C = 10\text{mA}$	50	–	–	V
Collector Saturation Voltage	$V_{CE(sat)}$	$I_C = 500\text{mA}, I_B = 0.5\text{mA}$, Note 3	–	–	1.5	V
Base Saturation Voltage	$V_{BE(sat)}$	$I_C = 500\text{mA}, I_B = 0.5\text{mA}$, Note 3	–	–	2.0	V
Collector Cutoff Current	I_{CES}	$V_{CE} = 50\text{V}, T_J = +25^\circ\text{C}$	–	–	0.5	μA
	I_{CBO}	$V_{CE} = 50\text{V}, T_J = +150^\circ\text{C}$	–	–	20	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 13\text{V}$	–	–	0.1	μA
Input Impedance	h_{ie}	$I_C = 20\text{mA}, V_{CE} = 5\text{V}, f = 1\text{kHz}$	50	500	–	Ω
Collector Capacitance	C_{cbo}	$V_{CB} = 10\text{V}, f = 1\text{MHz}$	–	5	10	pF
Gain Bandwidth Product	f_T	$V_{CE} = 5\text{V}, I_C = 20\text{mA}$	–	75	–	MHz
Delay Time and Rise Time	$t_d + t_r$	$I_C = 1\text{A}, I_{B1} = 1\text{mA}$	–	100	–	ns
Storage Time	t_s	$I_C = 1\text{A}, I_{B1} = I_{B2} = 1\text{mA}$	–	350	–	ns
Fall Time	t_f	$I_C = 1\text{A}, I_{B1} = I_{B2} = 1\text{mA}$	–	800	–	ns

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

